AMERICAN AVIATION

REFERENCE COPY

RECEIVED 7 JAN 1959 ARMY SERVICE RECORDS

January 26, 1959

Airlines' Strike Pact on Trial
Viscount/T-33 Collision Details
Jet Shortage by '62?
Aviation and the 86th Congress

American Airlines Scores a First . . .

FRIDAY

DEC. 1958

S	M	T	W	T	F	S
		1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

23

JAN. 1959

FEB. 1959

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

– APPOINTMENTS –

8:00
8:30

1:00
1:30 N.Y. to CHICAGO
2:00 VIA ELECTRA
2:30
3:00
3:30 LV. 1:00 P.M.
4:00 AR. 2:25 P.M.
4:30
5:00
5:30

SUNDAY

DEC. 1958

S	M	T	W	T	F	S
		1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

25

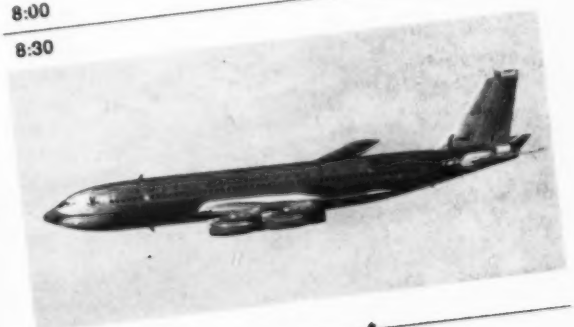
JAN. 1959

FEB. 1959

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

– APPOINTMENTS –

8:00
8:30



1:00
1:30
2:00 N.Y. to L.A.
2:30 VIA 707
3:00
3:30 LV. 6:15 P.M.
4:00 AR. 8:45 P.M.
4:30
5:00
5:30

Two New Turbines Launched Within 43 Hours

ARC's LATEST CONTRIBUTION TO AIR TRAFFIC CONTROL

Control Unit For Type 210

THE 360 CHANNEL TRANSMITTER-RECEIVER TYPE 210

As air traffic increases in volume, the question of safe and efficient control becomes more and more important. A vast increase in the number of assigned radio frequencies has been required in order to facilitate air-ground communications.

Only a few years ago pilots could operate with 10 or 20 channels. Later frequencies were increased to 80 or 90. Plans now call for 360 frequencies — enough to meet the need for years to come. In view of this channel increase, ARC now offers an all-channel, flight proven transmitter-receiver (Type 210 Transceiver) covering all 360 channels. The powerful 15 watts guarantees optimum distance range and the knifelike selectivity assures freedom from adjacent channel interference. Provision has been made for the selective use of single or double channel simplex. In the former, both reception and transmission are made on the same frequency; in the latter, transmissions are made on a frequency 6 megacycles higher than the receiving channel. There is no wait between receiving and transmitting for re-channeling.

This is ARC's latest contribution to air safety. Ask your dealer for a quotation to include a single or dual installation, along with other units of ARC equipment listed below.

Meets the CAA'S TSO C-37 and C-38 Category A

Aircraft Radio Corporation BOONTON, N. J.

30 YEARS OF ACHIEVEMENT IN AIRBORNE ELECTRONICS 1928 ARC 1958

OMNI/LOC RECEIVERS • MINIATURIZED AUTOMATIC DIRECTION FINDERS • COURSE DIRECTORS • LF RECEIVERS AND LOOP DIRECTION FINDERS
UHF AND VHF RECEIVERS AND TRANSMITTERS (5 TO 360 CHANNELS) • INTERPHONE AMPLIFIERS • HIGH POWERED CABIN AUDIO AMPLIFIERS
10-CHANNEL ISOLATION AMPLIFIERS • OMNIRANGE SIGNAL GENERATORS AND STANDARD COURSE CHECKERS • 900-2100 MC SIGNAL GENERATORS

Circle No. 1 on Reader Service Card.

AMERICAN AVIATION

January 26, 1959—Vol. 22, No. 18

Wayne W. Parrish .....Editor and Publisher
Joseph S. Murphy .....Executive Editor
Stanley C. Jensen .....Managing Editor
Eric Bramley .....Chief News Editor

DEPARTMENT EDITORS

DeWitt Ballew .....Business News
Betty Oswald .....Defense
George Hart .....Technical
Bill Combs .....Engineering
Robert Burkhardt .....Transport
Mel Sokol .....Airports
Clifford Allum .....Business Flying
Richard Golden .....CAB
Charles Schaeffer .....Congress
Gerald A. Fitzgerald .....Airline Economics
Wallace I. Longstreth .....Cargo
Fred S. Hunter .....West Coast
Richard van Osten .....West Coast
Anthony Vandyk .....International
Jean-Marie Riche .....Paris
Sam P. Saint .....Contributing Operations
Selig Altschul .....Contributing Financial
Jewelle Magarity .....Editorial Assistant

PRODUCTION

William H. Martin .....Art Director
Frank F. Kozelek .....Ass't Art Director
John Walen .....Production Manager
Elsie Gray .....Ass't Production Manager

EDITORIAL AND BUSINESS OFFICES

Lawrence L. Brettner, Circulation Director; George F. Peterson, Research Manager; Fay D. Crowley, Advertising Service Manager; Stephen A. Rynas, Advertising Promotion Manager; 1001 Vermont Ave., N.W., Washington 5, D.C., U.S.A. Phone: Sterling 3-5400. Cable: AMERAV.

REGIONAL OFFICES

New York City: 17 East 48th St., New York 17, N.Y., Robert Weston and Frederick W. Pratt, regional advertising managers. Phone: Plaza 3-1100. **West Coast:** 8929 Wilshire Boulevard, Beverly Hills, Calif., Fred S. Hunter, manager; William F. Toomey, regional advertising manager. Phone: Oleander 5-9161 and Olympia 7-1555. **Canada:** Allin Associates, 12 Richmond Street East, Toronto 1, Ontario. Phone: Empire 4-2001. Allin Associates, 1487 Mountain Street, Suite 4, Montreal, Quebec. **Chicago:** 139 N. Clark St., Chicago 2, Ill. Richard K. Helwig, regional advertising manager. Phone: Central 6-5804. **Cleveland:** 244 Hanna Bldg., 1422 Euclid Avenue, Cleveland 15, Ohio. Phone: Prospect 1-2420, Donald E. Murray, regional advertising manager. **Florida:** 208 Almeria Ave., Coral Gables, Fla., Richard D. Hager, sales representative. Phone: Highland 4-8326. **Geneva:** American Aviation Publications, 10 Rue Grenus, Geneva, Switzerland. Anthony Vandyk, European director. **London:** Norall & Hart Ltd., 28 Bruton Street, London W. 1., England. Phone: Grosvenor 8356. **Paris:** Jean-Marie Riche, 11 Rue Condorcet, Paris (9e). Phone: TRU 15-39. Cable Address: NEWS-AIR PARIS.

SUBSCRIPTION RATES

Single copies—$1.00. For U.S. and Canada—$10.00 for 1 year. Other countries—$15.00 for 1 year. Subscriptions limited to aviation industry personnel.

INCORPORATES

Airports and Air Carriers; Aviation Equipment; The American Pilot; Aviation Sales & Services; U.S. Aviation; American Airports and Airports & Heliports.

All rights to these names are reserved.

CHANGE OF ADDRESS

Send old address (exactly as it appears on mailing label on your copy of magazine) and new address, including zone number if any to American Aviation, 1001 Vermont Avenue, N.W., Washington 5, D.C. Allow two weeks for change.

PUBLISHING INFORMATION

Published every other Monday by American Aviation Publications, Inc., Washington, D.C. Printed at The Telegraph Press, Harrisburg, Pa. Accepted as controlled circulation publication at Washington, D.C. and Harrisburg, Pa.

Copyright © 1959, American Aviation Publications, Inc.

Hugh A. Day .....Assistant Publisher
James L. Brettman .....Adv. Sales Mgr.
Leonard A. Eiserer .....General Manager

SPECIAL FEATURES

American Scores a First (cover) 35
Airlines' Strike Pact on Trial 15
Viscount T-33 Collision Details 26
Jet Shortage by '62? 35
Aviation and the 86th Congress 17

NEWS FEATURES

How WAL OK's Reservations in Seconds 16
Latin American Fare Cutting May Be Ended 16
The Budget in Brief 18
Biggest Boeing 707 Makes First Flight 18
Tail Rotor Failure Blamed in 'Copter Crash 18
News Briefs 19

ENGINEERING & DESIGN

Visulator Ends Blind Flying in Simulators 20
Portable Noise Suppressor Fits Four Jet Types ... 20
GE Service Group to Handle Rotol Overhauls ... 21
Engineering Briefs 21

MATERIALS & EQUIPMENT

Automatic Aircraft Spray Nozzle 25
Lightweight Flight Recorder 25
ADF-Azimuth Device for Lightplanes 25
Runway Lighting System 25
Product Briefs 25

BUSINESS FLYING

Cessna Speeds Up and Quiets Three New Models 28
Executive VTOL Scheduled for Rollout 28
Business Flying Briefs 28

AIRPORTS & HELIPORTS

Airlines Unite to Finance Modern Airport 29
Airport Briefs 29

TRANSPORT AVIATION

Future for Argosy Freightercoach Looks Bright ... 37
Transport Briefs 38
CAB Report & Forecast 41

DEPARTMENTS

Personal View 5
Business 9
Letters 13
When & Where 13
Defense Angles 19
Literature 25
West Coast Talk 32
People 32
International Report 38
Statistics 40
En Route 42
Airtrends
Military 11
Manufacturing/Design . 12
Transport 33
Airports/Airways 34

Aircraft Data Cards
Lockheed C-130B Hercules, Cessna 310C, Martin P6M-1 SeaMaster 43

DESIGNED FOR WORLD MARKETS

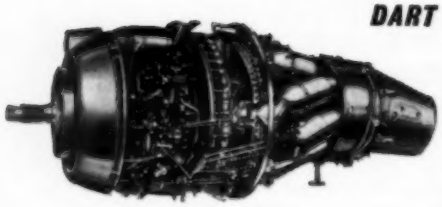
ROLLS-ROYCE

GAS TURBINES

are in service with or on order for

OVER 60 AIRLINES

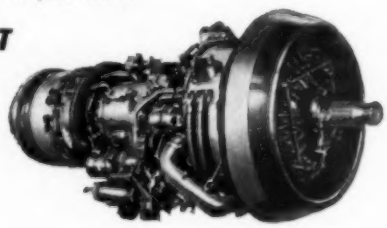
DART PROP-JET



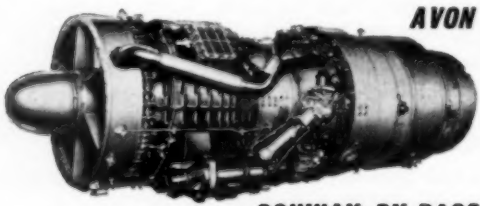
In service or under development at powers ranging from 1,400 to 3,200 h.p. The Dart is the most proven prop-jet in the world and has flown over 6,000,000 hours in scheduled airline service. It has an unexcelled record of reliability and is currently operating at overhaul lives of up to 2,200 hours.

TYNE PROP-JET

The Tyne is an advanced twin spool high compression engine due to enter service in 1960 at ratings of 4,985, 5,525 and 5,730 e.h.p. It has been designed to give low specific fuel consumption and is backed by the unique experience gained by Rolls-Royce in the operation of gas turbine engines in scheduled airline service.



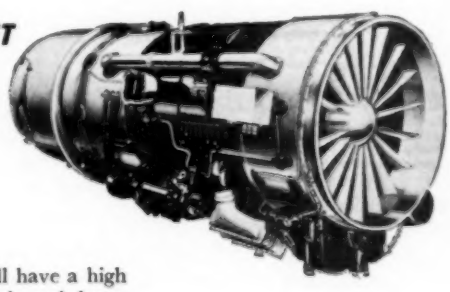
AVON TURBO JET



The Civil Avon has been developed to give low fuel consumption and long life between overhauls. The British Air Registration Board has already authorised its entry into service at an overhaul life of 1,000 hours.

CONWAY BY-PASS TURBO JET

The Civil Conway has the advantages of low first cost and operating costs, low weight, less noise and low specific fuel consumption. Initial Civil Conways have a guaranteed minimum thrust of 16,500 lb. and engines of 17,500 lb. and 18,500 lb. guaranteed minimum thrust, will be available.



RB. 141 BY-PASS TURBO JET

A new by-pass engine of advanced design, the RB. 141 will have a high by-pass ratio, and a specific fuel consumption and noise level much lower than any existing comparable engine.

Aer Lingus · Aerolineas Argentinas · Aerovias Ecuadorianas C.A. · Air Algerie · Air France · Air India International · Airwork · Alitalia Aloha Airlines · Ansett A.N.A. · Austrian Airlines · Avensa · Aviaco (Spain) · Bonanza Air Lines Inc · Braathen's S.A.F.E. · British European Airways · British Overseas Airways Corporation · British West Indian Airways · Butler Air Transport · Capital Airlines Central African Airways · Compania Cubana de Aviacion · Continental Air Lines · Eagle Aviation · East African Airways Corporation Finnair · Hong Kong Airlines · Hunting-Clan Air Transport · Icelandair · Indian Airlines Corporation · Iraqi Airways · K.L.M. Royal Dutch Airlines · La Nica · Linea Aeropostal Venezolana · Lufthansa · Middle East Airlines · Misrair · New Zealand National Airways Corporation · Northeast Airlines · Northern Consolidated Air Lines Inc · Ozark Air Lines Inc · Pacific Air Lines Inc · Pakistan International Air Lines · Persair (Iranian Government) · Philippine Air Lines · Piedmont Aviation Inc · P.L.U.N.A. (Uruguay) · Quebecair Inc · Royal Air Maroc · Scandinavian Airlines System · South African Airways · Taca (San Salvador) · Transair · Trans-Australia Airlines Trans-Canada Air Lines · Trans Mar de Cortes S.A. (Mexico) · Turk Hava Yollari · Union of Burma Airways · VARIG · VASP (Brazil) West Coast Airlines Inc · Wien Alaska Airlines Inc.

ROLLS-ROYCE LIMITED, DERBY, ENGLAND

AERO ENGINES • MOTOR CARS • DIESEL AND GASOLINE ENGINES • ROCKET MOTORS • NUCLEAR PROPULSION

Circle No. 2 on Reader Service Card.

How Big Is the Air Traffic Market?

How often in the past years have we heard and read speeches by Civil Aeronautics Board members that the airlines have barely scratched the surface of their potential market? And that the carriers have not been sufficiently imaginative and aggressive to develop merchandising programs "to get the masses to fly."

Usually these fervent pleas for more experimentation with low night fares and the like have come in response to airline requests for higher fares.

A sobering and incisive reply has come from Robert E. Johnson, senior vice president of United Air Lines, in a recent speech to the American Marketing Association.

Certainly Mr. Johnson with his thirty-year record in the industry has no doubts that total air passenger traffic is going to continue to grow at a substantial rate. Nor has he any doubt that jets will create new long-haul markets.

But he does cut through a lot of superficial nonsense that the air traffic market is unlimited and that it's easy to fill seats by pulling out of a hat a lot of new merchandising gimmicks.

Out of 175 million people in the U.S., only 12 million flew in 1958. A recent government survey reported that in 1957 there were 231 million roundtrips made out of town by individuals. These and other figures indicate an enormous potential for the airlines.

But Mr. Johnson points out how gross figures can be very misleading. Of all roundtrip travel in 1957, 69% of the trips were under 200 miles and 88% were under 500 miles. The automobile with its flexibility and convenience is the absolute king (89.5%) of intercity travel in this country and a great deal of this market cannot be touched by airlines either because of destination or cost or short-haul distance or a combination of these and other factors.

As a whole, Americans are not as great and regular travelers as statistics would often indicate. Not every person wants to go someplace, and even if he can be influenced to want to go someplace, preferably quite distant, he may not be able to afford to make the trip. He must have the desire and/or the need, and he also must have the means. Occupational responsibilities alone are a retarding factor. A majority of the 175 million population does not constitute a basic direct market for air transportation. More and more people will take to flying, but it is a slow process that can't be zoomed upward overnight by a lot of promotional fervor.

The speed and glamor of jets will be reflected favorably in the overall traffic statistics, but jets are a long-haul medium which will not produce direct results in the intermediate markets for some time to come.

There is more to developing a sound air transport system in the U.S. than crusades "to get the masses to fly." CAB policies and actions in creating excessive competition in some areas only make the expansion job more costly and more difficult. Frequency of service is an essential goal for a public carrier, but too much competition over some route segments actually is a deterrent rather than an incentive for frequency. We hope Mr. Johnson's speech will get the careful reading it deserves within the CAB.

Hopeful Sign in Labor

Labor Secretary Mitchell's plans to bring together soon labor and management leaders of airlines and railroads could lead to constructive action on the common carrier labor front.

The Secretary says he wants to discuss possible amendment of the Railway Labor Act. He is opposed to compulsory arbitration as being unworkable, but does believe it is essential (as he certainly should) to take all possible steps to avoid work stoppages, especially in disputes which are of jurisdictional nature.

The recent plague of airline strikes created a great amount of public pressure to work out new procedures and some Senators have introduced compulsory arbitration legislation. What is really needed, of course, is a more equitable bargaining balance between management and labor. There is no genuine collective bargaining possible when one side has more than its share of weapons—a take it or go bankrupt attitude—and there is no justification whatever for a strike over jurisdictional matters where management loses no matter which side it takes.

It will be interesting to see what Secretary Mitchell can do in his forthcoming conferences. Certainly public and economic pressures will not countenance a continuing work stoppage of common carriers.

Wayne W. Parrish

B-O-A-C orders

DECCA/DECTRA

The only navigation system which enables lateral separation to be exploited — a necessity for the efficient operation of jet aircraft

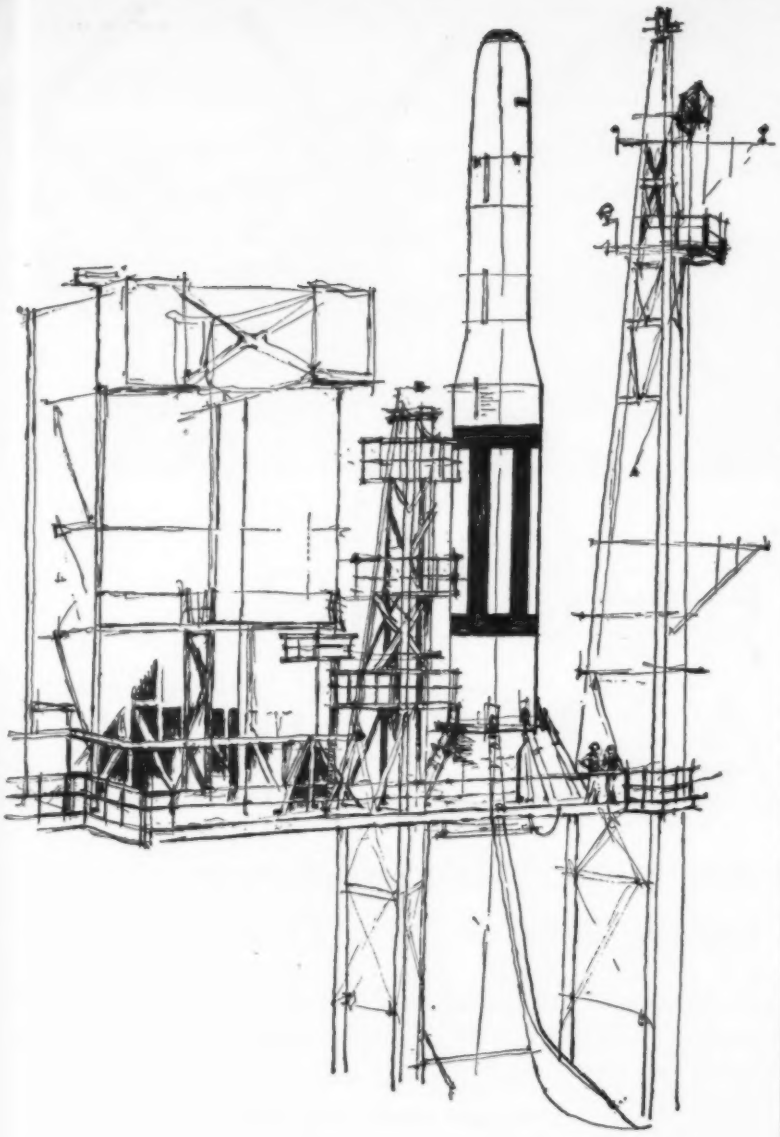
North Atlantic

for the COMET

fleet

THE DECCA NAVIGATOR COMPANY LIMITED LONDON

There is nothing else like this under the sun. It is the Martin-Denver facility, birthplace of the Air Force TITAN. It is also this country's most advanced and fully integrated big-missile development center. Here, our most formidable weapon systems of tomorrow are being designed, built and tested—from the smallest component to the total system—within a single 7,000 acre complex. Every top military and scientific expert who has seen Martin-Denver from *within*, considers it one of our most valuable national resources.



MARTIN
BALTIMORE · DENVER · ORLANDO

BUSINESS

Contracts to Watch

Next big contract by Air Force will result from the decision now pending on the early warning aircraft and control program. Lockheed could, despite hard competition from other companies, have the inside track because of past experience with this type of airplane.

Next big Navy contract will be to McDonnell Aircraft for the F4H aircraft.

Airborne Electronics:

Hoffman Electronics Corp.—$9,845,229 Air Force letter contract—part of an estimated $28,176,068 contract for the manufacture of AN/ARC-21C and AN/ARN-65 radio sets for all types of aircraft.

Aircraft:

The Martin Co., Baltimore, Md.—$23 million Navy contract for P5M-2 aircraft. Number has not been disclosed.

Aircraft Accessories:

Royal Industries, Inc.—$1.2 million Air Force contract for the manufacture of 450-gal. jettisonable fuel tanks for F-101 and F-100 aircraft.

Temco Aircraft Corp.—$4 million Lockheed Aircraft Corp. contract to fabricate components for the Electra turboprop transport and P2V-7 Navy patrol aircraft.

B. F. Goodrich Co., B. F. Goodrich Aviation Products, Dayton, O.—$91,958 Ogden Air Materiel contract for brake drum assemblies applicable to RF-84F aircraft.

Aircraft Instruments:

Kollsman Instrument Corp., Elmhurst, N.Y.—$67,293 Navy Aviation Supply Office contract for airspeed and Mach number indicators for various aircraft.

Aircraft Parts:

Bendix Aviation Corp., Red Bank Div., Eatontown, N.J.—$276,207 San Antonio Air Materiel contract for repair kits and spare parts applicable to various aircraft.

B. F. Goodrich Co., B. F. Goodrich Aviation Products, Dayton, O.—$150,063 Ogden Air Materiel contract for spare parts applicable to RF-84F and C-118 aircraft.

Northrop Aircraft Inc., Northrop Div., Hawthorne, Calif.—Two Ogden Air Materiel contracts totaling $97,287 for modification kits and spare parts applicable to F-89 aircraft.

Cleveland Pneumatic Tool Co., Cleveland, O.—Two Ogden Air Materiel contracts totaling $171,157 for spare parts applicable to F-86, C-119 and C-123J aircraft.

Ground Electronics:

International Business Machine Corp.—$11,799,231 Rome Air Materiel contract for expanded memory kits and related items for the SAGE system.

International Telephone & Telegraph Corp., ITT Laboratories Div., Fort Wayne, Ind.—Rome Air Materiel development contract of undisclosed amount for construction of a television communication system capable of sending a televised picture of coded data from SAC to Washington.

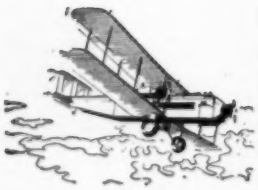
Bendix Radio Div., Bendix Aviation Corp., Baltimore, Md.—$2,201,747 Rome Air Materiel contract for heavy radar sets for long-range surveillance in an eastward extension of the DEW line.

Helicopters:

Gyrodyne Co. of America, Inc.—$2,750,000 Defense Dept. contract for further development and initiation of production of the company's remotely-controlled helicopter.

Meet the New ARGOSY!

THE WORLD'S FIRST TURBOPROP FREIGHTERCOACH TAKES ON A GREAT NAME IN CIVIL AVIATION



In the story of British aeronautical achievement, some great names stand out: aircraft that made their mark in the skies and helped to further aviation progress.

Such a name is the ARGOSY—the first civil aircraft built by Sir W. G. Armstrong Whitworth Aircraft Ltd., back in 1926. It made history as the first commercial aircraft to pay its way for an airline, and inaugurated Imperial Airways' famous Silver Wing lunch-time service between London and Paris. Economic operations were made possible by its trouble-free maintenance, reliability and carrying capacity.

The new turboprop ARGOSY, is the jet-age successor of its famous namesake. And like the old ARGOSY, the Freighter-coach (designated the AW650) will open a new era in air transportation. It is a most versatile aircraft. Not only can it carry up to 80 passengers in pressurised comfort at a speed of 300 miles an hour, it will also open a vast new market in air freight.

The modern ARGOSY carries over three times the load of a Dakota at twice the speed and half the cost.

PERFORMANCE

POWER: 4 Rolls-Royce Darts
AIRCRAFT CRUISING SPEED: (14,000 r.p.m.) 296 m.p.h.
MAXIMUM PAYLOAD: 27,000 lb.
RANGE WITH 20,000 lb. PAYLOAD: 1,600 st.m.
SIZE OF HOLD: 46 ft. 8 in. (14.23 m.) x 10 ft. (3.05 m.); floor area 426 sq. ft. (39.6 sq. m.).

SIR W. G. ARMSTRONG WHITWORTH AIRCRCAFT LTD., Baginton, Coventry, England
Member of Hawker Siddeley / One of the World's Industrial Leaders

The ***Argosy*** — BRINGS THE COST OF AIR FREIGHT DOWN TO EARTH

Circle No. 5 on Reader Service Card.

Navy won't conduct a complete evaluation of the Cessna T-37 trainer even though the flight instructors looked at the plane at Pensacola, Fla., at the request of Cessna in October and November. Navy wants to buy more T2Js, which North American is building at Columbus.

Navy should decide soon on the future of the Bell X-14 VTOL. Both Navy and Air Force are interested in a short takeoff and landing fighter for future use.

Military funding program will provide little in the way of new funds for Century series fighters in fiscal 1960. There won't be any new money for any fighter planes other than the F-105 and the F-108.

Defense Department's legislative program will include bills designed to ease "conflict of interest" rules, insurance for contractors against extra hazardous risks, renegotiation and to clarify the decision of the Supreme Court in the Murray Corp. case. Allowed to stand, Defense officials say that it could cost about $500 million in extra procurement costs if states were allowed to tax as personal property work in process by contractors for the Defense Department.

President Eisenhower will ask Congress for authority to veto line items in appropriations and authorization bills. Net effect would be to prevent increases by the Congress in budget items which the White House doesn't want. Chances of enactment are virtually nil because Congress wants to keep some control of the purse strings.

Economy bait is being offered in the form of tax revision if fiscal 1960 outgo doesn't exceed income. Chances are that current Congressional concerns over the state of military readiness will torpedo any real chance of a balanced budget.

A major investigation as to the adequacy of the national defense program can be expected with all of the conflicts brought out into the open before this session of the Congress ends.

Navy will likely standardize on the F4H McDonnell as its only long-range, all-weather interceptor after 1961, as it moves closer to the Air Force concept of reducing the number of aircraft types in inventory, to a special type for each specified mission. There will, of course, be attack aircraft and other types designed to handle such missions as antisubmarine, early warning and the like.

There will be a shakeup in supply and maintenance operations of the Air Materiel Areas once a successor to General Edwin Rawlings at Air Materiel Command is finally named.

Air Force is taking a new look at the Cook-Cragie plan to see how the philosophy which called for early purchases of production tooling as a means of cutting down leadtime works out under current conditions. Under this concept the production tooling is used to produce development models before test. Review will be at top level.

A way around the Budget Bureau's attempt to force witnesses to support the Administration will be sought—and probably found. One way is for the House Appropriations Committee to ask that key witnesses be sworn and then ask for opinions on the President's program.

Both Douglas and Lockheed can expect AF contracts for the DC-8 and the Electra if Congress approves money in the budget for jet transports. Since AF has already bought the 707, AF officials believe that Douglas and Lockheed should get a share of the business.

Fairchild still has a chance for a military order for the F-27. Air Force would use the plane for SHAEF headquarters on the theory that the engines can be serviced in Britain and Fokker can service the aircraft. A few more might be bought for USAF headquarters. Question is availability of funds.

North American's B-70 and F-108 programs took a last minute, unexpected budget cut, as a result of the Administration's determination to hold to a $40.85 billion appropriation request for the Defense Department. Result: Acceleration of the program, originally planned, will be possible only to a very limited extent.

British aircraft industry is glum about its future. Feeling is, barring war or an unforeseen rise in air travel, many firms will go broke in two to three years. Basic cause is rapid technical progress of the last decade. Though prices are up, profits and total orders are off, and the higher costs of commercial jets may retard or prohibit development of the next generation. Relief will be sought by mergers, government control, and shifts to nonaviation areas. Light aircraft and helicopter/VTOL markets may open new sales fields, too.

Airlines are stepping up the search for flight recorders to meet CAB requirement that every airplane operating above 20,000 ft. carry one. Only two makes now on the market meet the specifications of Aeronautical Radio, Inc. Many firms have proposed recording techniques, but few seem willing to undertake the necessary development work to produce an off-the-shelf item. United's purchase of the Waste King unit may show a trend to be followed by other carriers.

Extremely advanced electronic jamming and missile deception capability will be built into Boeing B-52 intercontinental jet bombers as the result of a multi-million-dollar Air Force program now under way. A major contractor in this program is Sperry Gyroscope Co.

Major weight-saving can be expected in engine and aircraft structures as a result of a new, foamed metal developed by General Electric's Flight Propulsion Lab. To date, nickel, copper and cast iron has been foamed to weigh as little as one-ninth as much as the solid metals for the same volume.

A jet reaction control system for use with an afterburning turbojet engine is being developed by Ryan Aeronautical Co. Application would be a Navy tactical type VTOL aircraft along the lines of the company's X-13 Vertijet research plane.

AF will approve Pratt & Whitney JT12s for the North American T-39 and in all probability for the UCX. Since these are "off-the-shelf" items, final engine selection rests with the manufacturers rather than the AF, according to the Pentagon.

Arc-discharge type hypersonic wind tunnel being built by Boeing is further proof of the growing interest in this means of high-velocity gas propulsion.

LETTERS

$84.95 Was Dream Stuff

It was good to see the very nice plug you gave Bill Larkins' book, "The Ford Story" in your issue of December 29. Being an aeronut of long standing, I too found this to be a fascinating study of one of the real pioneers of the airline business. Bill dug up just about everything there was to know about the corrugated monsters, as the result of many years of hard work. As you may not know, Bill also was the spark plug in founding the American Aviation Historical Society, a non-profit organization which is trying to document the history of aviation in this country. It's a very worthwhile group, made up of people from all walks of life with a common interest in historical aviation.

Incidentally, the price for Bill's Ford book can't be $84.95, as your column indicated. I'm sure Bill wishes this were true, but I doubt if even the nuts like myself would cough up that sort of money, even though we wanted the book in the worst way. My own copy doesn't seem to have a price mark on it, but I do know it was published in both a paper and hard-back cover, and at a very reasonable cost.

Gordon S. Williams, Public Rel. Mgr.
Boeing Airplane Co., Transport Div.
Renton, Wash.

EDITOR'S NOTE: A plague on an unalert staff for letting $84.95 get into print. Correct price is $8.95. And a second plague for skipping a correction in the following issue. Present address of the publisher is Robert R. Longo Co., P. O. Box 178, Tyler, Tex.

When & Where

FEBRUARY

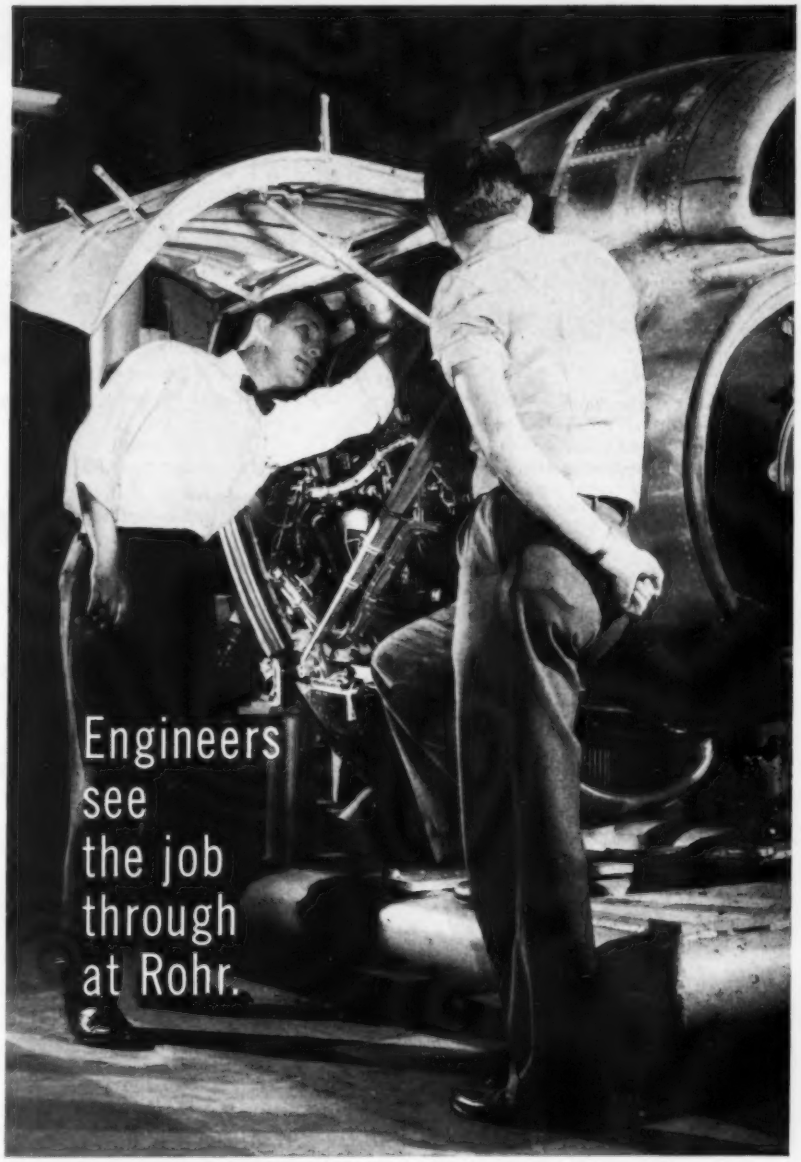
Feb 4-5—National Association of State Aviation Officials, board of directors meeting, Hotel Washington, Washington, D.C.

MARCH

Mar 5-6—IAS, flight propulsion meeting (classified), Hotel Carter, Cleveland.
Mar 6-11—ASME, engineering meeting on "The Turbine in Action," sponsored by the Gas Turbine Division, General Electric Co., Cincinnati.
Mar 31-Apr. 3—SAE, national aeronautic meeting, aeronautic production forum and aircraft engineering display, New York, N.Y.

APRIL

Apr 12-15—American Association of Airport Executives, annual convention, Savannah, Ga.
Apr 12-18—Air Force Association, First World Congress of Flight, combined with annual Jet Age Conference, Las Vegas, Nev.
Apr. 12-19—Air Line Pilots Association, Annual Safety Forum, Las Vegas, Nev.
Apr. 26-30—Airport Operators Council, 12th Annual Meeting, Portland, Oreg.



Engineers at Rohr enjoy the special satisfaction of seeing their ideas take shape from plans straight through production.

No studies that get pigeon-holed . . . no projects that never get off the ground . . . but important engineering jobs that get into production right here at Rohr.

And, Rohr, today offers experienced engineers the opportunity and security reflected in a backlog figure of over a quarter-billion dollars — more than 60% of which is in commercial contracts.

Currently Rohr needs Design, Liaison, and Structures Engineers who have a background of achievement . . . and who desire a future with greater satisfaction and accomplishment.

If you qualify, please forward full resume at once to J. L. Hobel, Industrial Relations Mgr., Rohr Aircraft Corporation, Chula Vista, California.

ROHR
AIRCRAFT CORPORATION

Chula Vista and Riverside, California

Circle No. 6 on Reader Service Card.

Truck installations supply pneumatic power for main engine starting, cooling and heating, electrical power for commercial jet powered airliners.

Dual carts for main engine starting, air conditioning and electrical power for military aircraft.

Reliable and versatile ground support

AiResearch MA-1A trailer for starting military aircraft. Nearly 2,500 in the field.

Air transportable pod for engine starting, cooling of electronic equipment and pre-flight checkout for military aircraft.

Lightweight Freon system, usually installed in a van or trailer, for cooling electronic equipment in support of missiles.

AiResearch ground support equipment is tailored to meet turbine powered aircraft and tactical missile requirements. Lightweight, compact units can be designed to specific configurations or installed on standard vehicles.

Heart of the lightweight ground support systems are AiResearch gas turbine compressor power units. Capable of delivering both electrical and pneumatic power, nearly 8,000 of these units are operating successfully and dependably in the field.

Support services can include: main engine starting, pressurization and air conditioning of cabins and compartments, missile pre-flight check-out, removal of snow and ice from aircraft and equipment, supply of DC or AC electrical power at any required frequency, and low pressure, high flow air for operation of a variety of actuation systems. The units have push-button starting and operate without delay under all weather conditions.

The world's largest producer of lightweight turbomachinery, the AiResearch Manufacturing Divisions are prepared to assume complete systems management responsibility for your ground support requirements.

ENGINEERING REPRESENTATIVES: AIRSUPPLY AND AERO ENGINEERING, OFFICES IN MAJOR CITIES

THE GARRETT CORPORATION

AiResearch Manufacturing Divisions

Los Angeles 45, California • Phoenix, Arizona

Systems, Packages and Components for: AIRCRAFT, MISSILE, ELECTRONIC, NUCLEAR AND INDUSTRIAL APPLICATIONS

Circle No. 7 on Reader Service Card.

Six-Carrier Strike-Aid Pact on Trial

- **$5 million has been paid out thus far**
- **Carriers are going all out to keep it**
- **But the fate of the "weapon" is up to CAB**

By DeWitt Ballew
Business News Editor

Keeping 150,000 people on the job is one of the scheduled airlines' biggest headaches. Even bigger than financing fleets of new multi-million-dollar transports.

If the Civil Aeronautics Board did not know this before, they got a lesson at mid-month as jet age lawyers representing six major airlines told the federal agency it will be an impossible task unless the carriers are given the right to tangle with highly skilled union specialists on an equal, dollar-for-dollar basis.

The airlines' labor woes were given public airing as they combined their legal talents in a first-round tussel with the powerful—and in some cases rich—unions. Disputes with organized pilots and ground personnel cost the carriers some 1.5 million man-days last year and their employes were out over $26.5 million in wages. One airline declared that it cost $35,000 a day just to keep the doors open during periods of strike. Total revenue lost forever was put at $75 million.

The hassel isn't a new one, but this one stems from a mutual aid pact signed by American Airlines, Eastern Air Lines, Pan American World Airways, Trans World Airlines, Capital Airlines and United Air Lines and submitted to the Board for approval last November 3. The Board heard oral arguments on the arrangement on January 14 and 15 and its finding is now pending.

Aimed at countering the "divide and conquer" tactics employed by certain unions, the pact provides that if one of the six carriers suffers a strike, the other five will share with the struck airline the extra profits made by carrying strike-diverted passengers. There are certain provisions which define conditions under which a carrier is considered eligible to receive payments, with a basic point being that all efforts to avert a strike must have been exerted. Capital Airlines was the first of the six to receive pay under the aid agreement.

American Airlines found itself in a displeasing predicament as the result of the nature of its strike. Member parties of the pact question whether AA qualifies, some contending full powers were not utilized in preventing the walkout. The present status is that all payments are being withheld pending further discussions.

For the other carriers, the pact has proved worthwhile. Individual sums do not tally with the overall $5,270,276 figure reported since there are some claims of overpayment and some claims declared but not paid due to settlements not yet completed. But on the basis of figures available, Capital Airlines has received $2,368,726, Eastern $625,420 and TWA, $2,276,130. All of the six airlines have contributed to the total amount.

The CAB hearings centered around whether or not an agreement to help each other is a tactic the airlines can legally use and whether it can be condoned by the Board. Here is what they must ponder.

The airlines contend that they no longer are able to stand alone against organized labor. Their only relief, they said, is to join ranks to relieve the "imbalance" that hangs over today's negotiation tables.

The unions are in strong variance with the carriers. They have demanded and received an extra pilot—making three pilots and a flight engineer—substantial pay increases for pure jet and turboprop aircraft plus various other benefits.

They argue that another pilot on the jets is essential for safety in operating the big planes and that additional earning power of the new aircraft entitles them to more money. They also hold the so-called 85-hour-working-month a fallacy, as frequently pilots put in as much as 200 hours a month as a result of flight conditions which force them to wait around airports for hours before they can swing into their cockpits.

It is all well and good, according to ALPA pilots, for the airlines to buy shiny new airplanes and increase earnings, but when the profit mellon is to be cut they want to be counted in.

Offsetting this money negotiating, one airline pointed out that at the end of 1957 it had 64 pilots making $20,000 in annual wages, whereas only seven company officials were in that bracket.

All of the airlines' unhappiness is not borne on the shoulders of ALPA, however. The Flight Engineers International Association and the International Association of Machinists, along with some 27 other labor organizations, all come under the blanket indictment that doing business singly with the workers is an unprofitable business for the carriers. They have unhappily learned the old axiom that unity and strength are synonomous.

That the unions have the greater strength at present is indicated by last year's history of labor strife. During the 12 months there was a total of 15 strikes in the airline industry ranging in duration from one-half day to 108 days.

Mike Quill, president of the Transport Workers Union, declared in a recent union paper editorial that he foresaw the airlines getting together to sign a mutual aid agreement. He declared that he realized what such a measure might mean in future negotiations and that as late as last December wrote AFL/CIO president George Meany suggesting that the various unions form a similar pact to protect themselves in future bargaining.

To the airlines, no such pact is needed by labor. They have found through experience that in most cases one union will respect the picket lines of a striking union and that when one group walks out, it generally means a major shutdown. They cite the IAM Defense Fund, which has swelled to over $2 million, and to the ALPA formula based on 5% of each month of the pilot's annual salary for the preceding year and results in strike payments of $350 to $650 a month.

Even in the case of Eastern Air Lines' recent strike, which did not involve pilots, but was a squabble involving FEIA and IAM workers, the pilots received full strike benefits because they were "supporting an ALPA policy." The policy involved was the crew complement issue.

The airlines consider the CAB arguments just the first round in their labor fight. If they win this one, they can be expected to go all out for a full industry-wide agreement whereby everybody will share each others grief.

WAL'S MASTER CONTROL CENTER links 96 reservations locations in 13 states.

How WAL OK's Reservations in Seconds

Western Air Lines' $2.25 million electronic reservation system, said to be the fastest and most reliable ever designed, has gone into operation at 96 locations in 13 western states.

In addition to checking availability, selling and canceling seats, the system will put a passenger on "stand by," sell roundtrips, cancel and rebook (or change booking) and establish partial confirmation.

Up-to-date flight information may also be handled. A special "Flight Information Panel" is a part of all agent sets to furnish data such as early or delayed flights and why. Time elements are broken down into 15-min. increments, and reasons include weather, equipment, mechanical, connections, winds and air traffic control. This information is also stored on the memory drum and may be read out by any station in the network.

Culminating two-year studies, the RESETRON (Reservations by Electronics) was designed and built by Teleregister Corp., Stamford, Conn., to meet WAL needs.

Basic components consist of a master data processing unit at the carrier's new reservations central control site at Los Angeles International Airport, and "slave" units for agents at high-volume on-line stations. Coded teletype will be used at low-volume locations.

A key part of the system is a magnetic memory drum in the L.A. master unit capable of handling data on as many as 60,000 flight segments up to six months in advance. The high-speed drum is "scanned" by 437 magnetic heads which read, erase or add data.

Agent locations are supplied with two sets of cardboard code plates—one set of Flight Plates and one set of Destination Plates. Flight Plates are used when referring to specific flight legs or combinations and may also be used for data on infrequently requested itineraries. Destination Plates are designed to each agent location's specific needs and present flights by destination. About seven Flight Plates will be required to show all WAL's flights by legs, and approximately four Destination Plates will provide an agent's set with the required coverage.

Agents using the system take four basic steps:

1. A code plate is set up—with the aid of a masking device—to introduce the customer's request into the system.
2. Colored "status lamps" indicate availability or unavailability of the space requested.
3. Destination or flight selection is made and a key punched to enter a "sell" record on the central control memory drum.
4. The agent's last action is to check three "reaction" lights. "OK" indicates that the transaction has been processed correctly and action is completed. "REJ" indicates that, despite the information given, the agent has attempted to sell an unavailable seat. "ERR" indicates a system malfunction or a situation incorrectly set up.

Stations with no agent set may use the system via a coded teletype message. If teletype errors occur, the master unit will automatically reject the message and reprint the message at the central control center, indicating why it was not accepted.

Another feature of the system for stations not equipped with an agent's set is that RESETRON will automatically broadcast up-to-the-minute status messages to keep such stations advised of space availability.

Fare-Cutting Practices of Latin American Airlines May Be Ended

Some hope of relief from the bitter and sharp fare-cutting practice of many Central and South American airlines was seen by U.S. carriers following a meeting of the Latins in Montevideo last month.

Called together for the first "working meeting" since the group organized the Asociacion Latino-Americana de Transportadores (ALTA) in April of last year, the group expressed an awareness that only by technical and financial arrangements between each other can they prevent a situation that in the long run will prove ruinous to the whole airline business in Latin America.

Two resolutions of primary importance were adopted at the meeting. The first was mainly in support of a meeting of Latin American civil aeronautics authorities representing the various governments. It would be held in Rio de Janeiro sometime this month and would be aimed at coordinating air legislation between the countries. The ALTA resolution supported the need for meetings of this type at regular intervals so that problems might be tackled in their early stages and it also endorsed proper rate structures covering the various types of services in the area.

The second resolution gave each member of ALTA the freedom to become a member of IATA and at the same time expressed hope that concerted action between the two associations might be reached at a future date.

The Montevideo meeting was presided over by Dr. Emilio Rodriguez Larrain of Aerolineas Perunas. One of the principal speakers was Sr. Rubem Berta, executive head of Brazil's Varig and also a member of the IATA executive committee. Sr. Berta described the general operating conditions of IATA and the advantages it offers members and, in turn, their responsibilities.

Berta said that he sympathized with the problems facing the carriers and declared that he is prepared to propose to the IATA executive committee that those carriers aspiring to membership in IATA be permitted a period of grace in which they would be allowed to operate at their present lower rates while establishing themselves in a position to live up to IATA obligations.

Also addressing the meeting was Sr. Rene Pairoa, executive head of Cinta-Ala of Chile, which operates low price services between Chile and the U.S.

He stated that most of the small Latin airlines hoped someday to join IATA and that the formation of ALTA was a step in that direction.

"We have created an economical type of service to suit the needs of travelers in Latin America," he said. "We operate in good faith and have established a place for ourselves in the travel market which we intend to defend. It is not fair to say that we have deviated traffic from the big carriers. Maybe there is some deviation of traffic to us because of our lower rates, but the bulk of our customers are people who could not otherwise have traveled by air."

Pairoa stated that he was convinced that establishing ALTA was a good thing and that "in time some harmonious relationship can be established between ALTA and IATA—and, in fact, it might eventually be possible for all of us to join IATA because we recognize the need for standardization of rates for different qualities of service, and the organization of resources for the benefit of the traveling public and the airlines themselves."

These expressions of interest in some possibility of meeting IATA regulations and operating conditions at a future date made U.S. flag carriers wonder. That they have a right to wonder is unquestioned, for unhampered by IATA regulations, paying lower wage scales, flying less expensive equipment, often strongly subsidized by their governments, and frequently concentrating on only the richer routes, the carriers from south of the border have been a persistent thorn in the financial sides of U.S. airlines.

These Latin carriers have far lower labor costs due to the cost-of-living. Their monthly pay for a top captain ranges from about $300 a month in Brazil to $1,100 a month in Cuba. This compares with $2,000 a month for top captains of Pan American flying the routes. Further examples are Pan Am's pay for top copilots of about $1,250 a month compared to a range of $250 to $575 for the Latins. And Pan Am stewardesses make around $418 per month whereas $250 is the very top for the competition.

A recent study shows that in the past half-decade airlines flying into Miami from Central and South American countries climbed from 11 to 23 and that the number of flights doubled, reaching 178 from 89. The impact is being protested by Miami civic organizations for the drawing-off of passengers from U.S. carriers is slicing airline revenues. This means one thing: labor layoffs, which is easily understood in all countries despite language barriers.

Aviation and the 86th Congress

Airport aid is the key bill for civil and transport aviation people, but scores more bear a close watch

A business-minded 86th Congress has set up shop on Capitol Hill. In three weeks the lawmakers have introduced 2,600 bills—many of which are of direct concern to the aviation industry.

They cover everything from military procurement practices and small business to airports, oversold airline passengers and the serving of stimulating beverages aloft by the air carriers.

Of special concern to the manufacturing industry will be legislation governing appropriations and authorizations for construction, renegotiation, procurement, labor, weapon system management, taxes, freedom of information, patent rights and a host of related items.

For transport and civil aviation, perhaps the most urgently needed single bill calls for an extension of the Federal Airport Aid Act for another five years. But the agenda is loaded with proposals to kill the World War II-imposed transportation tax, to permit free and reduced transportation to retired airline employes, to place stiffer penalties on bomb hoaxers, to end some airline subsidies and to put MATS passengers and services where they belong aboard the nation's commercial airlines.

Rep. Carl Vinson of the House Armed Services Committee has already signaled that he will lead a fight to limit the use of negotiated procurement contracts. The weight-carrying committee chairman is heavily armed for his attack on so-called "guaranteed profits," the Pentagon's method of bidding and the airing of prices offered by all bidders, not just the successful ones.

The Hebert Armed Services Investigation Subcommittee will again conduct various studies affecting the industry. A look at the weapon system mangement concept will definitely draw attention. Excess profits tax will also get the spotlight.

Sen. Leverett Saltonstall has already said he will work-over his previous legislation affecting renegotiation and weapon system management. He would exempt incentive fixed-price contracts from renegotiation. He would also extend weapon system procurement to all big military systems.

The matter of greatest general concern will deal with the proposed budget and what will be done about money the Congress has voted for specific projects, but which still hasn't been spent. Small business, which has concerned Congress for some time, finds leadership in Sen. John Sparkman and Sen. George Smathers, both of whom are critical of the Defense Department for failing to award more prime contracts to small firms. A problem they have to deal with is what happens when small business receives a contract and outgrows the 500-employe small business classification.

For the airline segment of the industry, both the Senate and the House are almost sagging under their legislative loads. In addition to the Federal Airport Aid Act, and probably of just as much concern, is the threat to bar the return of domestic trunk airlines to a subsidy status once they have been freed of this support. The CAB has already voiced its opposition to legislation which would limit its subsidy-determining flexibility.

The bill to ban drinking of spirits on flights, with ALPA its principal industry supporter, has also been introduced for another round of arguments. White House control and influence over the awarding of international routes will get a sound going-over this year by disgruntled lawmakers.

The anti-overbooking bill, which was introduced last year, also, would place a penalty on airlines if they inconvenience a passenger with an annoying oversale. Damage suits would be condoned up to an amount covering all actual damage plus twice the amount paid for the ticket, or $100, whichever is greater.

On the labor side of airline interest, one bill has been presented to the Senate which would re-work the Railway Labor Act and make Presidential Board recommendations binding. This compulsory arbitration has its supporters, but most of the airlines frown on such a scheme. Their recent mutual aid pact is more agreeable to them.

One far-reaching proposal, which has solid backing, but poor immediate prospects, would establish a national transportation agency. Under such a department all transportation would be subject to guidance of a secretary and would be completely divorced from the myriad of controversial elements with which it is now shrouded in the Department of Commerce. Possibly, almost all of the transport industry would favor enactment of such legislation, but no one holds out much hope in this 86th Congress for its passage.

The Budget in Brief

Avgas tax up, FAA to get $620 million in FY 1960, defense gets $40.8 billion

On Jan. 19, President Eisenhower presented a $77 billion budget request to Capitol Hill. It included as expected $40.8 billion in new money to run the Defense Department.

This includes 1,610 aircraft. A total of $355.6 million would be spent for development of the B-70 and F-108, $579.7 million for the production of the B-52G and $322 million for the KC-135. The Administration would continue to obligate about $150 million for the development of the nuclear propelled aircraft.

On the civilian side, President Eisenhower proposes:

- An aviation gas tax increase to 4½ cents. He wants the tax expanded to include jet fuels, now tax free. Tax revenues are estimated at $85 million annually and would be transferred from highway trust accounts to general revenue.
- For airports, new legislation aimed at cutting down on the Federal share. For a transitional program, President Eisenhower suggests sharing costs of basic facilities such as runways and grants, with revenue producing facilities such as terminals and hangars financed entirely by local authorities. Mr. Eisenhower recommends that one-half of the funds appropriated be made available to the States on the basis of the existing apportionment formula with the other half available only on a discretionary basis. Estimate of obligational requirement is $65 million for fiscal 1960.
- Civil Aeronautics Board operating subsidies mostly for local service airlines are estimated at $63 million.
- Total Federal Aviation Agency direct programs and airport grants call for an additional obligational authority of $620 million in 1960. Expenditures would amount to $560 million, according to Mr. Eisenhower's calculations.

Copter Crash Report

Failure of tail rotor drive system is blamed

The crash landing of a Sikorsky S-58B helicopter in the Gulf of Mexico last February has been attributed by Civil Aeronautics Board to "failure of the tail rotor drive system during takeoff, induced by previous undetected excessive loads."

The helicopter was one of ten being operated by Rotor Aids, Inc. for Humble Oil and Refining Co. to transport personnel between Grand Isle, La. and offshore oil-drilling platforms. After takeoff from one of these platforms, a sound similar to metal striking metal was heard, and directional control was lost. The helicopter struck the water in a level, upright attitude, but capsized when the left float broke away.

Four of the eleven occupants were drowned in the heavy seas running at the time, even though lifejackets were being worn. The Board says this may have been due to the fact that the type of lifejacket being used does not support the head in the event of physical collapse due to exposure, etc. Civil Air Regulations are being reviewed to determine whether or not amendments should be made to life-saving equipment requirements.

As far as failure of the tail rotor drive system is concerned, the manufacturer is developing inspection procedures designed to ensure detection of damage due to overload.

Biggest Boeing 707 Makes Its First Flight

Boeing Airplane Co.'s first 707-320 Intercontinental jet transport made its maiden flight at Renton Municipal Airport earlier this month. With 59 aircraft of this model on order by five airlines, Boeing is rapidly pushing towards delivery of the first plane to Pan American World Airways later this year.

The big plane will carry up to 189 passengers at more than 600 mph. It has a range beyond 5,000 miles.

FAA Contract to Fairchild For Look at Future Planes

FAA has let a contract to determine the performance characteristics of existing and future air vehicles that may be expected to operate in the Nation's common system of air traffic control.

Let on a cost-plus-fixed-fee basis and estimated to be $102,000, the contract was awarded to Fairchild Engine and Airplane Corp., Applied Science Division. Completion date has been set as September 30, 1960.

All types of aircraft will be covered in the study—from jets to lighter-than-air. Detail data will include information on the operations such as ground activities, preclimb, climb, en route, descent, glide path, and landing.

Westinghouse Develops Narrow-Band Search Radar

Westinghouse Electric Corp. has developed a new search radar using crystal control for greater stability. Instead of the usual rectangular pulse, a shaped pulse has been designed to decrease the band-width required for operation, allowing the high-power system to work in crowded environments without interfering with other electronic devices.

Kenney Heads Air Transport In Newly Set Up DOD Office

Organization of the Office of Transportation and Petroleum Policy at the Pentagon has now been completed by Transportation Director Earl B. Smith. Organization chart creates an air transportation division headed by R. M. Kenney, Jr.

The division handles all of the interests of the Defense Department in air transportation and aviation, both military and commercial. Its job includes responsibility for supervising Military Air Transport Service.

In addition to Mr. Kenney, there are two transportation specialists assigned to the division. These are: M. Uhrich and E. Marshall.

United to Use Own Design For DC-8 Wing, Tail Lights

United Air Lines will install high-intensity, oscillating wing tip and tail lights of its own design on its Douglas DC-8 jet transports. The standard rotating anticollision red beacon will be retained along with standard, steady position lights.

UAL's decision reportedly was made in the face of a decision by CAB to defer rule-making which would have permitted use of the UAL lights, and elimination of the rotating beacon and

other position lights. This rule-making was opposed vigorously by lighting systems manufacturers. (A/A, Nov. 17, p. 32.)

Present regulations covering exterior lighting require that steady wing and tail lights be used along with the rotating beacon. UAL feels that the addition of its oscillating system complies with this regulation on the grounds that these lights are lit at all times and, thus, are steady, even though intensity varies from 40 to 1,000 candlepower.

. . . News Briefs

• **Chrysler Corp.'s** 21 x 10-ft., wingless aerial platform is scheduled to fly during the early spring. Utilizing two ducted propellers, the vehicle is powered by a standard six-cylinder air-cooled engine. Simple deflecting vanes provide control.

• **Texas Instruments** has moved its Eastern Region Sales office to Elizabeth, N.J. from New York City. Office is in the City Federal Savings and Loan Building.

• **Robinson Aviation, Inc.** has formed and will operate a wholly owned subsidiary known as Robinson Plastics, Inc.

• **Singer Military Products Div.** has opened a Solana Beach, Calif. office with Robert E. Alderman, Sr. in charge. Address is 126 S. Acacia Ave.

• **Strato-Safety Manufacturing Corp.,** manufacturing safety equipment for jets and other vehicles, has been organized by The Dayton Rubber Co. Products include such things as oxygen hose, oxygen masks and survival kits for jet travelers.

• **Fairey Aviation's Rotodyne** has established what company officials claim is a world speed record for VTOLs. The radical aircraft flew 100 kilometres at cruising power at an average speed of 190.0 mph.

• **FAA has enlisted the aid** of the Civil Air Patrol to take a nationwide survey of general aviation traffic. CAP volunteers will question pilots to determine the pattern of aircraft activity. A second survey in midsummer will provide data in a peak season.

• **Air Force** has purchased three 295-hp Helio Super Courier STOL aircraft "to evaluate operational techniques." The contract with Helio Aircraft Corp. was awarded this month, after an Edwards AFB team completed tests proving accuracy of the manufacturer's claims as to performance, etc. (A/A, Dec. 15, p. 32).

DEFENSE ANGLES

By Betty Oswald

Congress will consider a Defense budget calling for commitments of $42.7 billion in fiscal 1960. According to President Eisenhower, it will provide a "sensible posture of defense."

But what is "sensible?" Congress is expected to ask many questions seeking a definition and is likely to come up with as many answers as there have been to the question of what is "reasonable."

The budget admittedly is a compromise satisfying no one. Theoretically, it needs what President Eisenhower terms an "urgent" threat while holding out the promise of a modest budget surplus and perhaps even a tax reduction. It fails to meet the tests imposed by the Gaither Committee, the Committee for Economic Development, the Rockefeller Bros. Foundation report on national security and lately the report of the National Planning Association—all of which have consistently recommended stepped up defense programs designed to strengthen the U.S. hand in dealing with Russia.

Similarly the budget will fail to satisfy the strategists—who fall into three separate groups.

The first argues that only a lunatic would start even a limited war in the face of potential nuclear destruction. They argue that the U.S. needs only enough retaliatory power to absorb the first blow and to fight back. Some in this group believe that even a lunatic would be deterred by a little more power. However, this generally is known as "limited deterrence" theory.

The second group believes that the Kremlin might coldly decide to risk destruction of 20 to 30 cities in order to destroy the United States. They argue that the only way the United States can remain safe is to develop sufficient power to destroy Russian society even after absorbing a surprise air attack. However, this group can't agree on the size of the forces needed. Some argue that part of the U.S. forces would be destroyed, with the result that a larger initial force than is now available would be needed for insurance.

It's the third group that's likely to have the most influence on Congressional thinking. It believes that for the foreseeable future, the U.S. must maintain a force-in-being more powerful than Russia's. This does not mean a larger force. Thesis here is that while a second-best strategic force might stop an all-out war, it would not stop the type of war most likely to occur.

What this group expects is that war would start by taking small chunks of noncommunist territory, with the use of "volunteers" or native rebels, or even a kind of economic or diplomatic blackmail. The U.S. would thus be required to commit part of its forces in a series of holding actions, depleting strategic forces to a point where the enemy might consider that a successful attack on the United States would be feasible.

While this viewpoint probably represents the majority of the strategists, it breaks down because of the argument as to whether the same kind of forces can handle both the limited and the big war. Here the question is: "What should the product mix be?"

And here there are no answers.

• **Stans applies a gag**—Congress will have more than the usual trouble trying to get straight answers this year. Budget Director Maurice H. Stans has tried to build a successful roadblock, designed to prevent an airing of conflicting viewpoints. He said in a memorandum dated December 31 addressed to Defense Secretary McElroy: "It is expected that witnesses will carefully avoid volunteering views differing from the budget, either on the record or off the record. While direct questions at hearings must be answered frankly, it is expected that a witness who feels that he must set forth a personal view inconsistent with the President's budget will also point out that the President's judgment on the matter was reached from his overall perspective as the head of the Government and in light of overriding national policy."

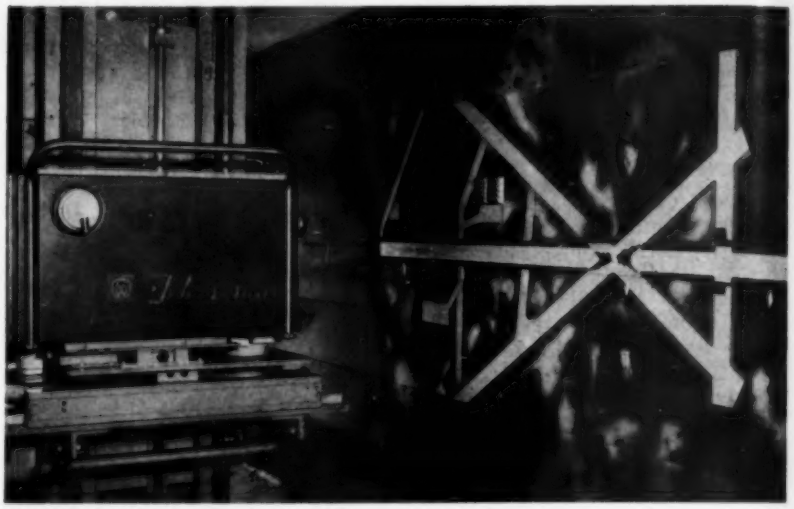
Earlier in the memorandum, Mr. Stans noted: "The President is responsible for reviewing the total needs of the executive branch in the *light of tax and debt policy* and for deciding among competing requests for priorities." [Italics supplied.] Mr. Stans was notably silent on the need for a review in the light of national security needs.

Visulator Ends Blind Flying in Simulators

With jet transport operating costs in the neighborhood of $1,000 per hour it's not surprising that more and more operators are planning to train crews with flight simulators. But, until recently, simulated takeoffs and landings have been made "blind"—not a likely situation in actual practice.

Now, simulator manufacturers are taking steps to fill the gap with visual training aids like the Visulator—a $162,500 closed-circuit television device manufactured by Curtiss-Wright Corp.'s Electronics Division.

Equipped with a unique wide-angle lens, the TV camera transmits an image of an airport model to a projector mounted above and behind the simulator cockpit. The picture is then reproduced on a 26 x 15-ft. screen mounted 10 ft. in front of the cockpit; brightness is about that of an outdoor movie.



VISULATOR is designed for use with any type of simulator.

The airport model is scaled to 1600:1 and is equipped with appropriate landmarks such as hangars, towers, etc., as well as approach and runway lights; any desired airport can be reproduced.

When setting up the equipment, the runway selected is aligned carefully with the TV camera tracks. With the "plane" on the ground, the camera lens is only .05 in. from the surface of the runway. Safety devices prevent damage to the lens in the event of a "crash."

As the takeoff is started, the camera moves down the runway. It is activated by signals from the simulator's computers to respond to acceleration, roll, pitch, yaw, etc. resulting from the pilot's handling of the controls, and is not programmed in any way.

As the "plane" becomes airborne, the camera draws away from the model, giving the impression of climbing out. The effect of going into cloud is accomplished by fading out of the picture, starting at the top of the screen. When in cloud, light and dark patches are simulated realistically by TV trick effects. Other effects in the works include rain, snow, etc.

After takeoff, the pilot may conduct a pattern, approach and landing, and the camera's actions coincide dutifully. If the pattern, or other training exercises, should carry the camera to the end of its tracks, it simply waits until the plane comes back within range, gets picked up, and heads off as directed by the computers.

Coming in for a landing, the plane breaks out of cloud, approach lights are seen in the correct position and perspective, along with the runway beyond. Altitude of the "cloud base" and other effects are set up by the instructor.

Black and white presentation is standard, but color reproduction is available—for an additional $156,000.

Portable Noise Suppressor Fits Four Jet Types

Douglas-Long Beach is using a portable noise suppressor that is adaptable to all four jet engine types now planned for transport use.

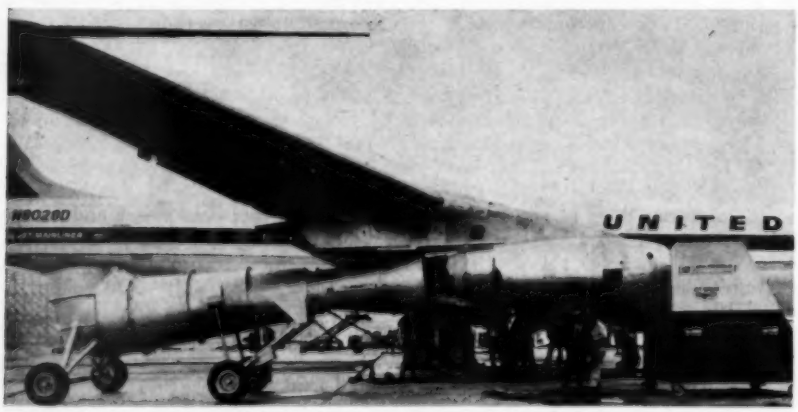
Called the Model 1815, it was built by General Sound Control, Inc. and is presently being used for ground runup demonstrations.

Mounted on an adjustable undercarriage, it can be attached to either inboard or outboard nacelles. Steering and tow provisions are incorporated.

Built of steel with high temperature alloys in the internal structure, the GSC device weighs about 8,800 lbs. and has an overall height of 11 ft., an overall length of 26½ ft.

The suppressor includes an augmentor-adapter to fit a straight turbojet exhaust nozzle as well as multiple-lobe, tube, or ejector type suppressor nozzles.

Engine capabilities include Pratt & Whitney JT3 (J-57), JT4 (J-75), General Electric's CJ-805 (J-79), and the Rolls-Royce Conway.



First to be equipped with the Visulator will be Federal Aviation Agency's Boeing 707 simulator, now nearing completion at the Electronics Division plant in Carlstadt, N.J.

GE Service Section Will Handle Rotol Overhauls

Aircraft Service Shops Section of the General Electric Co. has signed an agreement to provide evaluation and overhaul of warranted products for Rotol Inc.—makers of propellers and gearboxes for the Viscount, F-27, and Gulfstream.

The move is designed to provide "in-warranty" service at locations strategic to airline and executive operators of aircraft with Rotol equipment. Over $1 million in inventories will be carried at shops in Bergen, N.J. and Seattle, Wash. Another shop will be opened this spring in Ontario, Calif., and future sites are planned for Cincinnati, O., and Arkansas City, Kan.

Rotol Inc. is an American subsidiary of Rotol Ltd., Gloucester, England.

. . . Engineering Briefs

• **Vickers-Armstrongs (Aircraft) Ltd.** and The English Electric Co. Ltd. have been given the responsibility for development of a new RAF tactical support reconnaissance aircraft, on a 50-50 basis, by Britain's Ministry of Supply. Designated the TSR2, the all-weather, supersonic plane will be powered by a new turbojet engine to be developed by Bristol Siddeley Engines Ltd.,

• **Three airlines** have contracted with the Metal Products Div. of Koppers Co., Inc. for design and production of sound suppression equipment for a total of five jet engine test cells. Pan American World Airways will have one cell at New York International Airport, United Air Lines will have two at San Francisco International Airport, and two will be built by Scandinavian Airlines System at Stockholm, Sweden.

• **Collins Radio Co.** will supply the complete communication, navigation and identification systems for McDonnell Aircraft Corp.'s F4H all-weather jet interceptor.

• **Continental Air Lines** now is operating the Rolls-Royce Dart 525 turboprop engines in its Viscounts at 1,100 hours between overhauls.

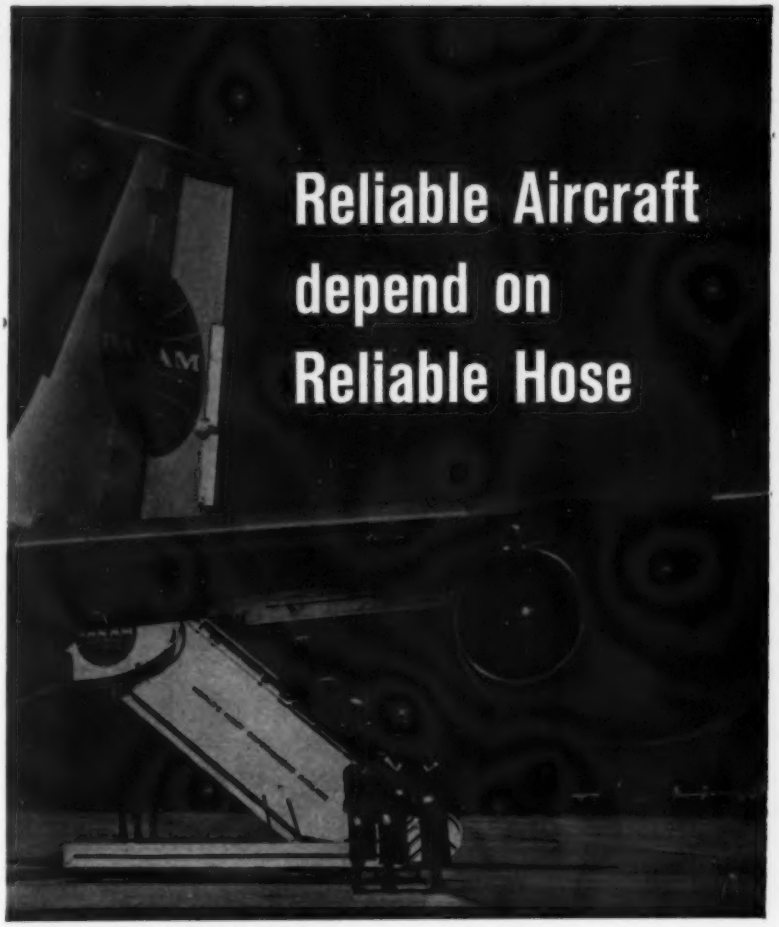


Photo courtesy Pan American World Airways.

MODERN military jets have proven Fluoroflex®-T (Teflon®) hose in rugged service. Now the fast new commercial airliners use this same hose—for safety *and* economy.

Fluoroflex-T hose, with patented, specially compounded tube of Teflon, is non-aging—has no shelf or service life limit. Originated by Resistoflex, Fluoroflex-T was the first Teflon hose and it has been flying for five years on all types of jet and reciprocating engines and aircraft. It is available with compression-type fittings or "Seal-Lock*" reusable fittings.

Always specify the hose with highest performance and capabilities—not only for safety's sake, but for savings as well. Send for details. Write Department 197, RESISTOFLEX CORPORATION, Roseland, New Jersey. Other Plants: Burbank, Calif.; Dallas, Tex.

**T. M., Pat. No. 2,853,319*

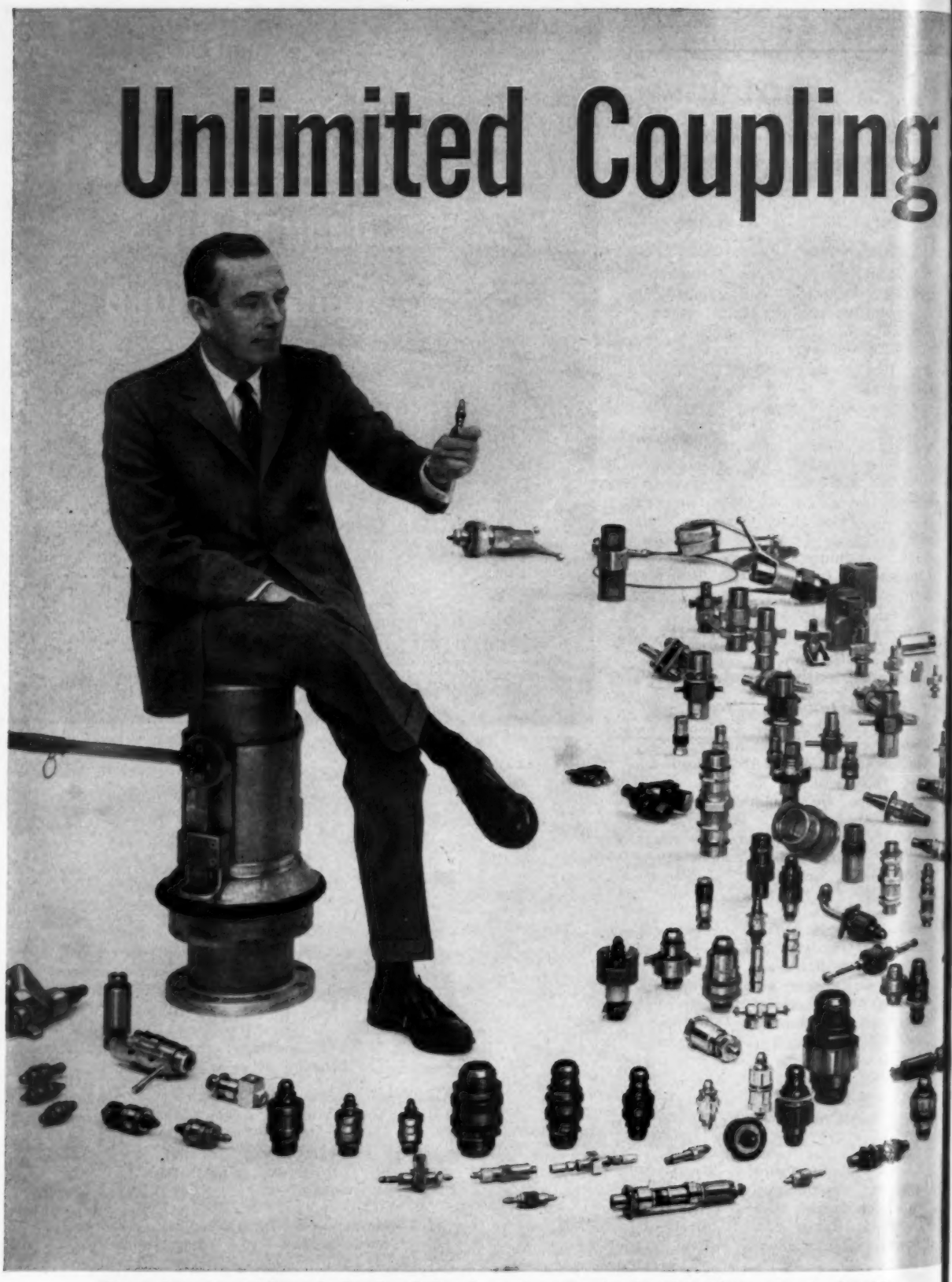
® Fluoroflex is a Resistoflex trademark, reg., U.S. pat. off.
® Teflon is DuPont's trademark for TFE fluorocarbon resins.

Originators of high temperature fluorocarbon hose assemblies

Resistoflex

Circle No. 8 on Reader Service Card.

Unlimited Coupling



Tremendous range of Aeroquip Coupling designs is demonstrated by B. A. Main, Jr., Vice President of Engineering, seated on a 10-inch coupling while holding a miniaturized coupling in his hand. The couplings shown here are only a few of the infinite variety developed by Aeroquip for use with hydraulic fluids, ordinary and exotic fuels, gases, oils, air, liquefied gases, ammonia, nitric acid, ethylene oxide and many other fluids.

Designs!

WITH A WEALTH OF EXPERIENCE PLUS UNMATCHED FACILITIES, AEROQUIP DESIGNS, TESTS AND PRODUCES COUPLINGS TO MEET YOUR SHORT LEAD-TIME REQUIREMENTS

Call on Aeroquip for the solution to your fluid coupling problem. Let us know your requirements on fluid, temperature, pressure, size and application, and Aeroquip will recommend, design and produce the coupling that meets your needs . . . and do it FAST!

This is the service that Aeroquip is especially well qualified to provide for manufacturers of missiles, aircraft and accessories and components.

Years of experience gained in building millions of couplings enables Aeroquip to approach your problem with complete knowledge and understanding. Development facilities include extraordinary engineering depth plus extensive laboratory, shop and test equipment. Production and quality control facilities are the finest and most modern in the industry.

At Aeroquip, coupling designs and facilities are UNLIMITED!

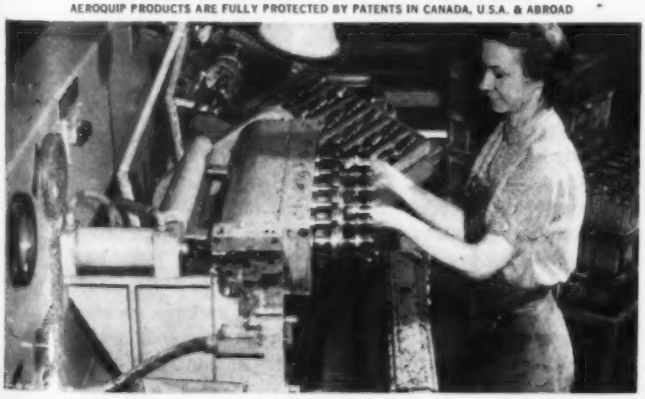
Aeroquip

REG. TRADEMARK

AEROQUIP CORPORATION, JACKSON, MICHIGAN
AEROQUIP CORPORATION, WESTERN DIVISION, BURBANK, CALIFORNIA
AEROQUIP (CANADA) LTD., TORONTO 19, ONTARIO
AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN CANADA, U.S.A. & ABROAD

Birthplace of many new coupling designs is this modern design section in Aeroquip's development-engineering center at Jackson, Mich. Another engineering staff is maintained at the Western Division in Burbank, Calif., which also produces couplings.

Testing equipment that duplicates conditions ranging from arctic cold to the searing heat generated by jet or rocket engines in flight is included in the development-engineering section, at Jackson, which occupies over 15,000 sq. ft. of floor space.



Aeroquip's high standard of reliability is assured by final proof testing of all couplings. The proof test machine pictured above was specially designed by Aeroquip for maximum dependability and speed. Final testing follows numerous quality control checks during production.

Production facilities in the Jackson plant include this battery of automatic screw machines. Complete manufacturing operations are duplicated in Aeroquip's Western Division plant.

FILL IN AND RETURN THIS COUPON FOR COMPLETE COUPLING INFORMATION

Aeroquip Corporation, Jackson, Michigan
Please send me further information on Aeroquip Couplings. I am chiefly concerned with the following:

Fluid to be used_____
Temperatures from_____° to_____°.
Pressures from_____psi to_____psi.
Size_____I.D. Operation ☐ manual ☐ remote ☐ other

Name_____ Title_____
Company_____
Address_____
City_____ Zone____ State_____

(For a 14" x 10" lithographic print, suitable for framing, write Aviation Division . . . request Historical Series #1.)

The last sortie of the "Red Knight", Baron von Richthofen . . . on his tail, Captain A. R. Brown in a Sopwith Camel.

Early War Birds—THE SOPWITH CAMEL F-1

By the end of World War I, this British airplane had more victories to its credit than any other type on either side, an estimated 1,294. Powered with a 130 h.p. rotary engine, the Camel had a maximum speed of 113 m.p.h., a climbing rate of 880 feet per minute, and a ceiling of 19,000 feet. Eccentric, easy to spin and with sensitive controls, this snub-nosed plane was the despair of fledglings. Yet, its quickness, tight turning ability, and synchronized twin Vickers guns made it a deadly weapon in the hands of an experienced pilot like Captain Roy Brown.

On a chilly morning in April of 1918 this Canadian veteran, with 18 months of combat, led a flight of 15 Camels over the Somme battle lines, where they soon engaged in a wild melee with a flight of Albatroses and Fokker triplanes. After five minutes of furious fighting, Brown saw a fellow Canadian, Wilfred May, frantically trying to shake a Fokker triplane from his tail. With his guns jammed, May had twisted and slipped downward until he ran out of sky fifty feet over the Somme River.

Brown dove to his rescue, shooting the last of his ammunition at the red triplane and causing it to falter, stall, then glide to earth just in back of the Allied trenches. The red triplane bumped to a stop. In the cockpit, his lifeless hand still on the stick, was the German Ace of Aces, Baron Manfred von Richthofen. The Sopwith Camel had achieved its most illustrious victory.

Phillips 66

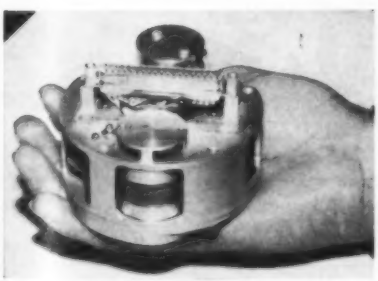
● A pioneer in the development of aviation fuels, Phillips Petroleum Company is today a leading supplier of high octane gasoline for commercial, private, and military aircraft . . . and of *super-performance* jet fuels for turbo-props and jets. And Phillips research continues to lead the way, developing new fuels for the aircraft of tomorrow.

AVIATION DIVISION • PHILLIPS PETROLEUM COMPANY • BARTLESVILLE, OKLAHOMA

Embedded Runway Lighting

Strategic Air Command is testing two types of light fixtures to be embedded in runways. Every type of aircraft in the U.S. arsenal, as well as many civilian types will be included in the evaluation which is aimed at assisting jets in high-speed night approaches. Both lights feature General Electric Parabolic Aluminized Reflector (PAR) lamps developed especially for this purpose.

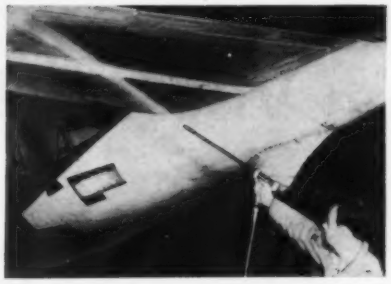
Circle No. 116 on Reader Service Card.



Lightweight Recorder

An airborne tape recorder, described as the world's smallest, has been developed by the Leach Corp. Total unit weight is 24 oz. It is said that the device has been tested under operating conditions for vibration of 15Gs without shock mounting, and impact of 2,000Gs in the three principal planes. Unit has tape speeds from 0.25 to 15 in. per sec. with tape widths of 1 and ½ in. Recording times are given as 60, 30, 15, 8, 4, 2, and 1 min. Wow and flutter under static conditions is said to be less than 1%. Other environmental features include a temperature range of minus 50 to 200F, and relative humidity of 0 to 100%. Power required is 24 volts dc.

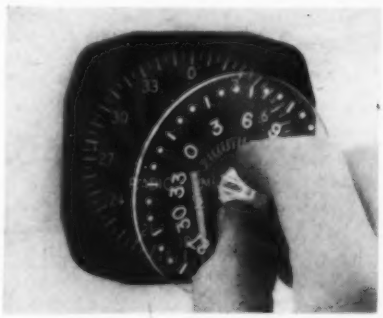
Circle No. 117 on Reader Service Card.



Automatic Spray Nozzle

Strahman Valves, Inc., New York, has introduced an automatic spray nozzle for applying washing and deicing compounds. It is designed to give a stream variable from a fine mist for large areas to a solid stream for remote corners. Control is a hand trigger. Made of stainless steel and bronze, the entire working assembly is contained in a removable cartridge and has nylon bumpers around the nozzle housing to prevent drop damage.

Circle No. 118 on Reader Service Card.



ADF-Azimuth Device

An inexpensive device that enables pilots to obtain instantaneous low-frequency station headings has been developed by the Aircraft Instrument & Systems Division of Coffing Industries, Inc., Covington, Ind. It consists of a plastic dial that fits over the airplane's radio compass. To use, the pilot tunes to the desired station, then sets his present compass heading on the indicator over "0"; then the needle automatically points out the correct compass heading to the station. Indicator can also be used to take "cuts" for position fixes, or track outbound from stations. Fully guaranteed by the manufacturer, it is priced at $11.90.

Circle No. 119 on Reader Service Card.

. . . Product Briefs

• **Blast deflector**—USAF has announced the purchase of a new-type jet blast deflector fence built by Standard Railway Equipment Mfg. Co., to be installed at Eglin AFB, Fla. It will be 1,280-ft. long, and consist of 2½-ft. wide, 10-ft. high modular steel panels joined into sections of 80 to 100-ft. in length. Standard makes three models of fences—one-way solid, two-way solid, and two-way perforated. They are either 7, 10, or 12-ft. high and are assembled with 5.6 bolts per foot. The two-way model protects against blasts from either side, and is particularly useful for full-thrust blasts. The perforated fence has 23% of its surface punched with 1½-in. dia. holes on 3-in. centers. These holes act to spend the blast trapped in them, while the remaining 67% acts as a deflector, sending most of the blast straight up.

Circle No. 120 on Reader Service Card.

• **Relief valve**—Republic Mfg. Co., Cleveland, O. has made a new approach to high-flow relief valve operation. Designed for high-pressure, high-flow and high-temperature applications, it comes in pressure ranges up to 5,000 psi. Adjustment over the entire range can be made by turning the external adjusting nuts, without disconnecting either pressure or return line. Also provides free flow in reverse direction. Entire design contains only one packing, and O-ring which can be replaced without taking the valve out of the line.

Circle No. 121 on Reader Service Card.

. . . Technical Literature

• **Adjustable speed drives**—16-page brochure from Servo-Tek Products, makers of the 100,000-hr. tachometer generators, also describes dc motor operation from ac power sources, with schematic diagrams and specifications.

Circle No. 122 on Reader Service Card.

• **Solid polyurethane**—ASME paper expanded by Disogrin Industries, Inc. gives methods of polyurethane fabrication and various applications.

Circle No. 123 on Reader Service Card.

• **Oil leak detection**—Single-sheet brochure describes product which can detect hydraulic system, fuel line, fuel tank, and induction system leaks.

Circle No. 124 on Reader Service Card.

• **Strain gages**—Four-page, two-color brochure giving information for users of strain gages, load cells, resistance thermometers, pressure transducers, and other resistance bridge transducers.

Circle No. 125 on Reader Service Card.

• **Automation**—32-page booklet titled "Better Products for Automation Through Standardization." Text is taken from lectures, conferences and seminars.

Circle No. 126 on Reader Service Card.

CAB Report on Viscount/T-33 Collision

Synopsis

On May 20, 1958, about 1129 e. d. t., a Capital Airlines [CAP] Viscount, N 7410, and a Maryland Air National Guard T-33,35966, collided in the air about four miles east-northeast of Brunswick, Maryland. Seven passengers and the crew of four aboard the Viscount were killed. A passenger in the T-33 was killed but the pilot, although severely burned, parachuted safely. Both aircraft were totally destroyed.

The collision occurred at an altitude of about 8,000 feet on Victor Airway 44 while the Viscount [CAP Flight 300] was descending en route from Pittsburgh to Baltimore-Friendship Airport. It was operating on an instrument flight rules flight plan but in visual flight rules weather conditions. The T-33 pilot was on a VFR proficiency flight from Martin Airport, Baltimore, Maryland. Just before the collision the aircraft were observed in the area west of Brunswick flying parallel easterly courses with the T-33 some distance behind and to the left of the Viscount. The T-33 quickly overtook the Viscount and made a gentle right turn, during which it struck the forward left side of the fuselage of the Viscount.

Both aircraft were being operated in visual flight rules weather conditions and it was therefore the responsibility of each crew to provide separation from other aircraft by visual reference. The right-of-way rules contained in the Civil Air Regulations clearly set out the pilot's responsibility in the overtaking situation [CAR Part 60.14].

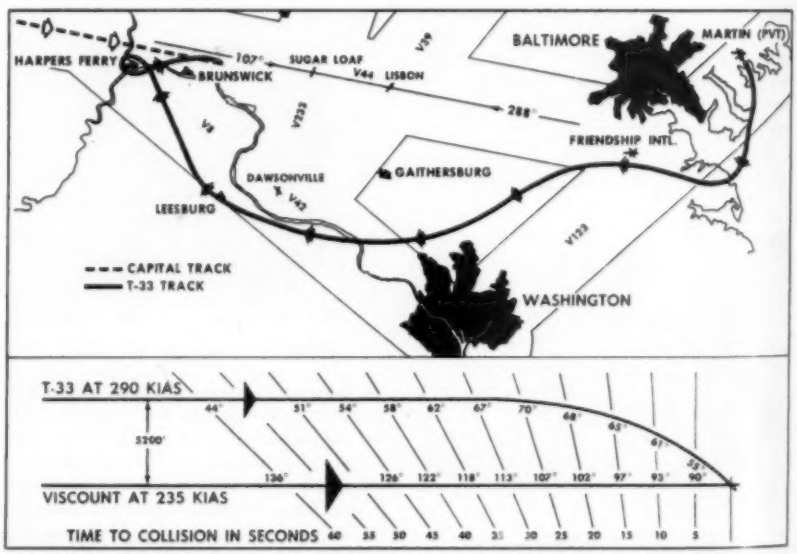
The Board determined the probable cause of this accident was the failure of the T-33 pilot to exercise a proper and adequate vigilance to see and avoid other traffic.

Investigation

At 1126 Capital 300 reported over Martinsburg, leaving 10,000 feet, estimating Baltimore at 1139. When this report was received, [Washington] Center was able to establish identification of the flight by radar.

Recordings of the conversation between Center and Flight 300 were analyzed. From these it was determined that approximately 41 seconds after the flight reported over Martinsburg it was given a further clearance by the Center controller to descend to cross Sugar Loaf intersection at 5,000 and to maintain 5,000. CAP 300 acknowledged this clearance and reported leaving 9,000 feet. This transmission was made approximately 48 seconds past 1126 and was the last transmission from the flight.

The Washington Center controller who was controlling CAP 300 stated that at the time the target was first identified on the radarscope, Flight 300 was on V-44 proceeding eastward and there was no other traffic noted within 15 miles of it. In addition, no other target was seen in the vicinity of Flight 300 at the time of the final radio contact. He said that a few minutes after the final transmission, on one sweep of the antenna he saw a faint return of a target near CAP 300. On the next sweep the target had disappeared and the "blip" which was known to have been the Viscount was somewhat enlarged. The controller initiated a call to the flight to determine its altitude and to advise of possible VFR traffic but was unable to contact Flight 300. The target of Capital 300 remained almost stationary on the scope for about a minute and then faded. It was determined that this call was made three minutes and three seconds after Flight 300 had made its report over Martinsburg.



T-33/VISCOUNT crash occurred at limit of range of Washington Center radar.

Analysis

It appears probable to the Board that the faint return on the radarscope followed by the enlargement of the Viscount target seen by the center controller working Flight 300 was, in fact, the collision. No other reasonable explanation can be advanced to account for these observations. Allowing 10 seconds (one sweep of the radar antenna) for the controller to verify the target first observed and 8 seconds for evaluation and initiation of his transmission, it was possible to estimate closely the time of the accident. As stated before, the controller's transmission was made three minutes and three seconds after Flight 300 had reported over Martinsburg at 1126. Subtracting the 18 seconds estimated to have elapsed prior to the call it is determined the accident occurred about 2 minutes and 45 seconds after 1126. As the point of collision, determined from ground witnesses, was 14 miles from Martinsburg, it was calculated that the ground speed of the Viscount was approximately 304 knots. With corrections for altitude, temperature, and wind it was further calculated that the indicated airspeed of the Viscount was about 235 knots. This speed is approximate and may vary slightly but it is within the range of normal operation. Any variation in this speed would not affect this analysis, which is based on damage patterns and which indicates relative motion only between the two aircraft.

From a study of the inflight damage

to the two aircraft, it was determined that initial contact between them was when the nose section of the T-33 right tip tank struck the left side of the Viscount fuselage just ahead of station 132 below the floorline. As a result of this impact the nose section of the tank was crushed inward and rearward. Rivet scratches on the tank also running inward and rearward confirm the fact that the damage resulted from loads acting inward and rearward at an angle of approximately 47 degrees. The Viscount fuselage conversely was destroyed by loads acting from left to right with some indication of an upward component at station 132.

Following this initial impact, which separated the nose section from the T-33 tip tank, the main section of tank contacted the Viscount fuselage below the forward entrance door. The next area of impact was between the T-33 wing and the Viscount fuselage, upward and forward of the initial impact area. This destroyed the right wing of the T-33 and shattered the nose structure of the Viscount. The forces which destroyed the wing acted rearward, inboard, and downward as evidenced by the bending of the front spar upper cap and scratches running aft and inboard at angles of 42 degrees to 45 degrees on the top surfaces of wing fragments. Damage to the Viscount nose structure was caused by loads acting predominantly from left to right.

The outer portion of the right horizontal stabilizer of the T-33 was destroyed when it struck the upper left Viscount fuselage between stations 198 and 232. Scratches found on fragments of this structure ran aft and inboard at angles of 35 degrees and 45 degrees. Again the damage to the Viscount was due to forces acting from left to right.

A study of this damage showed best agreement in matching the observed collision damage of the two aircraft when the longitudinal axes were pointed toward each other with an angle of approximately 42 degrees between them and with the aircraft rolled into one another with an angle of approximately 25 degrees between the vertical axes. With this relative attitude constant during the period, there was generally good correlation between the damage from the time the nose section of the tip tank contacted the Viscount fuselage until the T-33 right horizontal tail hit. Because the vertical closure between the two airplanes was obviously small, it was assumed to be negligible as compared to the horizontal closure.

From this study it was determined that the airspeed of the T-33 was approximately 55 knots greater than that of the Viscount at the instant of impact. The rate of closure between them was approximately 195 knots.

It is significant that the eyewitness' descriptions of the collision are entirely consistent with the inflight damage to the two aircraft. The Board believes, from all the evidence, that the Viscount was flying a straight course but descending at a normal rate and at an indicated airspeed of approximately 235 knots; further, that the T-33 was flying a straight course which was parallel and to the left and behind the Viscount. Although in a shallow climb of a few degrees its airspeed was higher and it was overtaking the Viscount. A short interval before colliding the T-33 began a normal right-hand turn and continued in this turn until striking the side of the airliner. Although the T-33 was in a slight climb and the Viscount was in a descent, it is doubtful that the small vertical closure would be perceptible to ground witnesses.

Based on the above mentioned evidence, a study was made of the relative opportunities for the various crew members to see the other aircraft during the 60 seconds immediately prior to collision. At the instant of impact the flight path of the Viscount was assumed to be straight while that of the T-33 was assumed to be in a coordinated turn to the right. At an angle of bank of 25 degrees and an airspeed of 290 knots IAS (551 feet per second true), the T-33 would have a radius of turn of about 20,300 feet. To have struck the Viscount at an angle of 42 degrees, the T-33 would have had to have started its turn about 26 seconds before collision from a parallel course about 5,200 feet to the left. The resultant angular relationships of the two aircraft were as follows:

Time to collision	Angle of T-33 from Viscount to left of nose	Angle of Viscount from T-33 to right of nose	Distance between airplanes
5 sec.	90°	55°	1,700 ft.
10	93	61	3,150
15	97	65	4,200
20	102	68	5,000
25	107	70	5,450
30	113	67	5,650
45	126	54	6,400
60	136	44	7,450

A comparison of these angles with the cockpit visibility charts for the Viscount shows that the copilot could not have seen the T-33 until at the instant of impact. The pilot could not have seen the T-33 until about 26 seconds prior to collision because of the intervening fuselage aft of his left window.

As for the T-33 pilot, there was no obstruction to his seeing the Viscount for well over a minute before collision.

From a study of weather reports for the area, supported by testimony of ground witnesses, it appears most likely that the cloud coverage below 12,000 feet in the accident area consisted of one- to two-tenths of fair weather cumulus clouds based at approximately 4,500 feet with very little vertical development. One or two eyewitnesses stated that the jet momentarily passed through or behind one of these small clouds, but all witnesses were in general agreement that both aircraft were clearly visible for a considerable period of time prior to the collision.

Civil Air Regulations require that all pilots in VFR weather conditions maintain separation from other traffic visually, irrespective of the type of flight plan or clearance. In addition, these regulations have established right-of-way rules governing the flight of converging aircraft. Here the evidence shows that both aircraft were being operated in VFR weather conditions; also, that the T-33 was behind and overtaking the Viscount. Civil Air Regulations clearly state that an aircraft being overtaken has the right-of-way. The overtaking aircraft, whether climbing, descending, or in horizontal flight shall keep out of the way of the other aircraft by altering its course to the right, and no subsequent change in the relative position of the two aircraft shall absolve the overtaking aircraft from this obligation until it is entirely past and clear.

The evidence is clear that the T-33 pilot had ample opportunity to see the Viscount and avoid it.

With respect to the Viscount, whether the 26-second sighting possibility is adequate is less clear. Numerous studies have been conducted on this subject and the conclusions reached are nearly as numerous. Most of these studies agree that after another aircraft is sighted evasive action can be accomplished in less than 26 seconds. An area of disagreement exists, however, as far as the time required to scan for and detect other aircraft and to determine that a collision course exists.

In this accident it is obvious the Viscount pilot did not see the T-33. It is fundamental that a pilot's primary responsibility is to direct his attention to the most critical area, which is ahead of the aircraft. This is in no way intended to mean pilots should not look around and take any action necessary to avert collisions. It does mean, however, that a greater degree of vigilance is required in the direction the aircraft is flying.

In this collision the T-33 could have been seen about 26 seconds before collision. The Board does not believe that the fact the Viscount pilot did not see the T-33 in this period of time indicates a lack of vigilance. It is believed there may be periods of time considerably longer than this in which a pilot may not have the opportunity to clear behind him. It is not unreasonable therefore to place responsibility for collision avoidance on the aircraft which is behind and overtaking and, in fact, under the Civil Air Regulations, the overtaking aircraft is clearly burdened to see and avoid other aircraft.

As stated before, the Board believes that the collision was observed on the radarscope by the controller. It is tragic that no return was received from the T-33 in time for the controller to take action to alert the crew of the Viscount. As more advanced and sensitive equipment is developed many limitations of radar traffic control will be alleviated and it should be possible to prevent this type of aircraft accident.

NOTE: This report is taken from CAB files. Portions of the section on investigative procedures have been omitted. Similarly, that portion of the Synopsis which deals with the Board's recommendations has been omitted. A reduced version of the Board's Conclusions has been incorporated in the Synopsis.

BUSINESS FLYING

Cessna Speeds Up, Quiets Three '59 Models

Minor but significant changes in the 1959 versions of Cessna Aircraft Company's 180, 182 and Skylane aircraft have resulted in faster, quieter and more attractive models for the potential owner.

Relocation of the powerplant accessories in the tricycle gear 182 and Skylane has made possible an improved aerodynamic redesign of the forward fuselage and cowling. Added to this improvement is the installation of retractable cowl flaps controlled by a push-pull mechanism on the instrument panel. Skylane models have as standard equipment, drag reducing fillets attached to redesigned wing strut attachment points. The upper wing fillet incorporates a retractable tie-down ring.

Net result of the streamlining is a gain of 2 mph cruise and high speeds over last year's models and a 26 and 30 mile increase in range for the Skylane and 182, respectively.

All three models are powered with 230-hp Continental 0-470 engines of improved design. New four-ring pistons are used for which better service under all operating conditions is claimed.

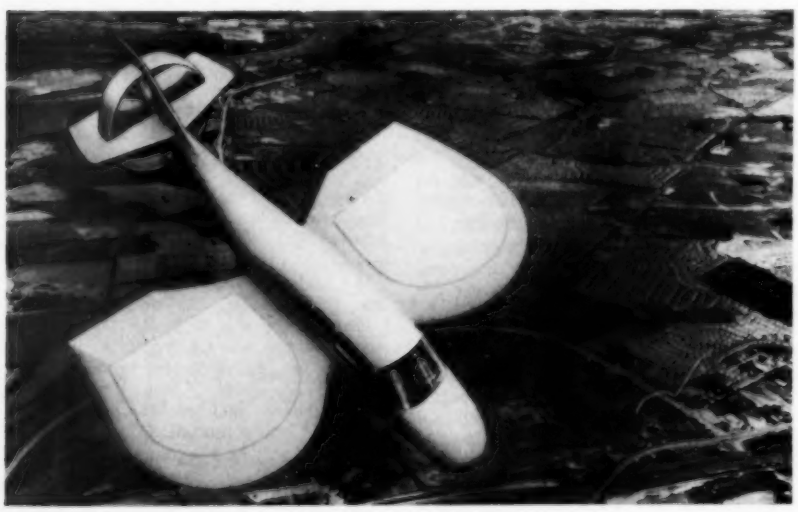
The instrument panel on all models has been redesigned for maximum efficiency. A shock-mounted instrument group is located on the left and engine instruments and other gages are mounted on a stationary panel on the lower center and right side.

Provision for two radios and an ADF has been made along the top center of the panel with space provided for either Tactair T-1, T-2 or T-3 autopilot units above the central radio.

Other improvements include the addition of an entrance step on 182 and Skylane models, new type sun visors, built-in chart case, optional three position tilting front seats and a wide range of other optional equipment, interior fabric designs and exterior color schemes. In addition, customers have a choice of either a Hartzell or McCauley propeller. The 180 is again available on floats or amphibious floats.

Cessna Specifications

Model:	Skylane	182	180
Seats:	4	4	4
Dimensions:			
Length	26 ft.	26 ft.	26 ft.
Span	36 ft.	36 ft.	36 ft.
Height	9 ft. 9 in.	9 ft. 9 in.	7 ft. 6 in.
Weights:			
Empty	1,594 lbs.	1,532 lbs.	1,554 lbs.
Gross	2,650 lbs.	2,650 lbs.	2,650 lbs.
Powerplants:	Cont. O-470-L	Cont. O-470-L	Cont. O-470-K
Rating:	230 hp	230 hp	230 hp
Performance:			
High speed —at S/L	170 mph	167 mph	170 mph
Cruise speed 70% power at 8,000 ft.	160 mph	157 mph	160 mph
Initial rate of climb	1,030 fpm	1,030 fpm	1,130 fpm
Range (55 gal. usable fuel)	845 mi.	835 mi.	845 mi.
Price (Standard):	$17,095	$14,600	$14,250



Unique Executive VTOL Scheduled for Rollout

Vanguard Air and Marine Corp., Audubon, Pa., is about to roll out a new vertical-lift executive aircraft of unusual design. Under construction for nearly a year, it derives its vertical lift from shrouded propellers within low aspect ratio wings. The aircraft changes from vertical lift to forward flight by adjusting wing closures which converts the wing to a high-lift surface.

. . . Business Flying Briefs

• **Hiller Aircraft Corp.,** Palo Alto, Calif. has received a type certificate for its recently introduced 12E helicopter. It is the first aircraft to be certificated by the newly-created Federal Aviation Agency.

• **Mooney Aircraft, Inc.,** Kerrville, Tex. has formed Mooney Sales Co. to handle the increased production of aircraft and allied products.

• **Bogus aircraft parts** which once plagued the aviation industry appear to be confined to the surplus military aircraft market. FAA feels that it is no longer a major problem.

• **Corporate owners of transport** category aircraft will benefit from CAB regulation (SR-426) which permits considerable increases in payload for aircraft equipped with Aerojet General Corp.'s standby rocket engines.

• **Continental Motors Corp.** is reported developing a special version of its I0-470-M engine for use in Custer CCW-5 channel wing aircraft.

Carriers Unite to Build a Modern Airport

By Mel Sokol
Airports Editor

Long lagging, the development of O'Hare International Airport to meet Chicago's air traffic and jet-age needs will receive a major forward thrust this month with the signing of an agreement unique in the annals of airport user contracts. Involved is a $120-million, 40-year bond issue on which 16 air carriers serving the city, in effect, guarantee to meet principal and interest payments through landing fees.

Under the agreement, landing fees will fluctuate rather than be fixed. The amount paid by the airlines in each fiscal year will depend on the amount needed to cover operating and maintenance expenses and reserves; and, beginning in fiscal 1962, 1½ times the principal and interest requirements on bonds outstanding—after deduction of airport revenues derived from other sources. Each airline's share will be based on the total approved maximum landing weight of its aircraft operating into the field.

On the basis of estimates prepared by Coverdale & Colpitts, consulting engineers, this means that for the year beginning Jan. 1, 1959, effective date of the contract, the airlines will be required to pay a total of $1,542,000 in landing fees—equivalent to $2.06 per passenger enplaned at O'Hare. In 1961, this cost will rise to $2.26 per passenger, but as O'Hare handles an increasing share of Chicago's air traffic and revenues increase, this is expected to drop to 23 cents a passenger in 1965.

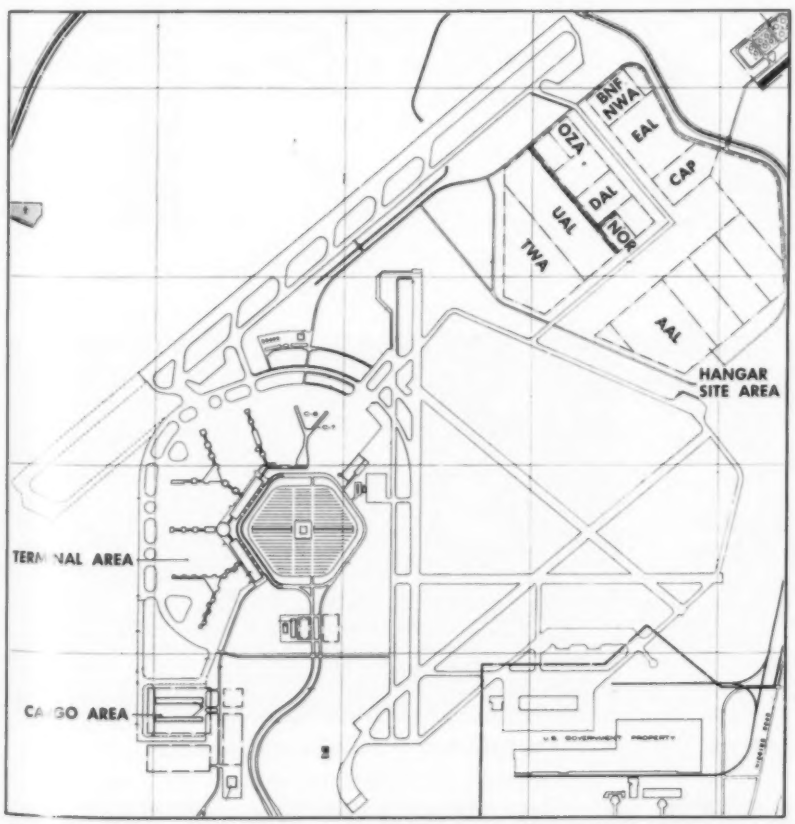
The initial high landing fees are due to two factors: Lack of traffic and lack of any sizable concession or other revenue. While O'Hare has been open to scheduled passenger service since October 1955, in 1958 it enplaned an estimated 603,000 passengers vs 4,869,000 at Midway. Not until 1964, are the scales expected to tip in favor of O'Hare. Then, O'Hare should be enplaning 54.2% of the total 8.5 million passengers taking off at Chicago, and, in 1955, 75% out of a total 9.1 million passengers.

Airlines have been reluctant to move their operations to O'Hare despite overcrowding at Midway principally for economic reasons. Among these are the much lower landing fees at Midway and the large investment of the airlines in facilities there. In addition, Midway is more accessible to Chicago's Loop, and, further, 30% to 40% of Chicago traffic is connecting so that the greater percentage of flights must be concentrated at one airport.

However, the jets are reversing this situation since they can't operate at Midway. Also, O'Hare will be easier to get to when the Northwest Expressway is completed in Mid-1960.

The $120-million bond-financed expansion program will cover only the first stage of development of O'Hare as the city's major air terminal and is based on meeting traffic forecasts through 1965.

Upon completion, the present terminal will be renovated for use by international air carriers, customs and immigration services. All work is scheduled to be completed within 33 months after the sale of the bond issue which is virtually assured. Construction will begin this summer.



FIRST STAGE includes two new terminal buildings with facilities. Y-shaped structure above hexagonal parking area is existing terminal and concourse.

. . . Airport Briefs

• **Cincinnati, Ohio,** may scrap its plans for development of a major airport for feeder-type operations. The matter rests on the results of a suit seeking to enjoin the city for appropriating a section of road bisecting the Blue Ash Airport site on which construction of the airfield is planned. If the city loses, consensus is that the city should sell the land, abandon the project.

• **Buffalo (N.Y.) Municipal Airport** will start an $8-million expansion program next spring. Initial phase will be financed with the aid of $350,000 in federal matching funds.

• **Inadequacy of Stapleton Field** facilities, coupled with an announcement that Buckley Field will be abandoned, has caused Denver, Colo., officials to review the possibility of building a new airport on the 3,588-acre Navy site.

Los Angeles Times

IN THREE PARTS — 36 PAGES

TIMES OFFICE

CC TUESDAY MORNING, FEBRUARY 24, 1942. DAILY, FIVE CENTS

SUBMARINE SHELLS SOUTHLAND OIL FIELD

An almost forgotten incident of World War II occurred on February 24, 1942, when an enemy submarine surfaced off Southern California's coast and shelled an oil field with its deck guns—then submerged and escaped to sea.

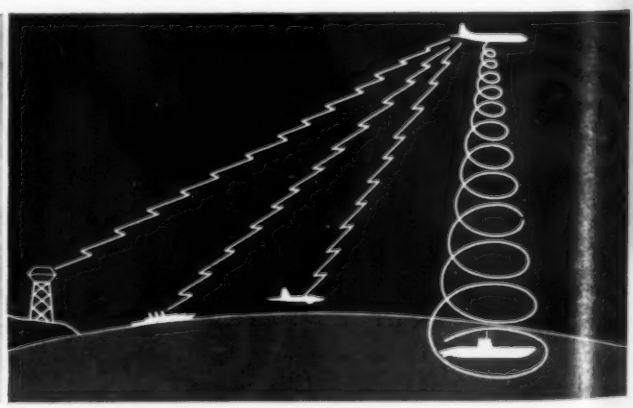
Only a few thousand people lived within range of that sub's guns. Today, from that same offshore location, an enemy submarine of the latest type could launch long-range missiles with atomic warheads to devastate target areas any place in our 17 westernmost states (population 40,000,000).

The Navy foresaw many years ago that *every* U. S. citizen would someday be vulnerable to atomic missiles launched from enemy subs—and initiated an aggressive Anti-Submarine Warfare program to negate that threat.

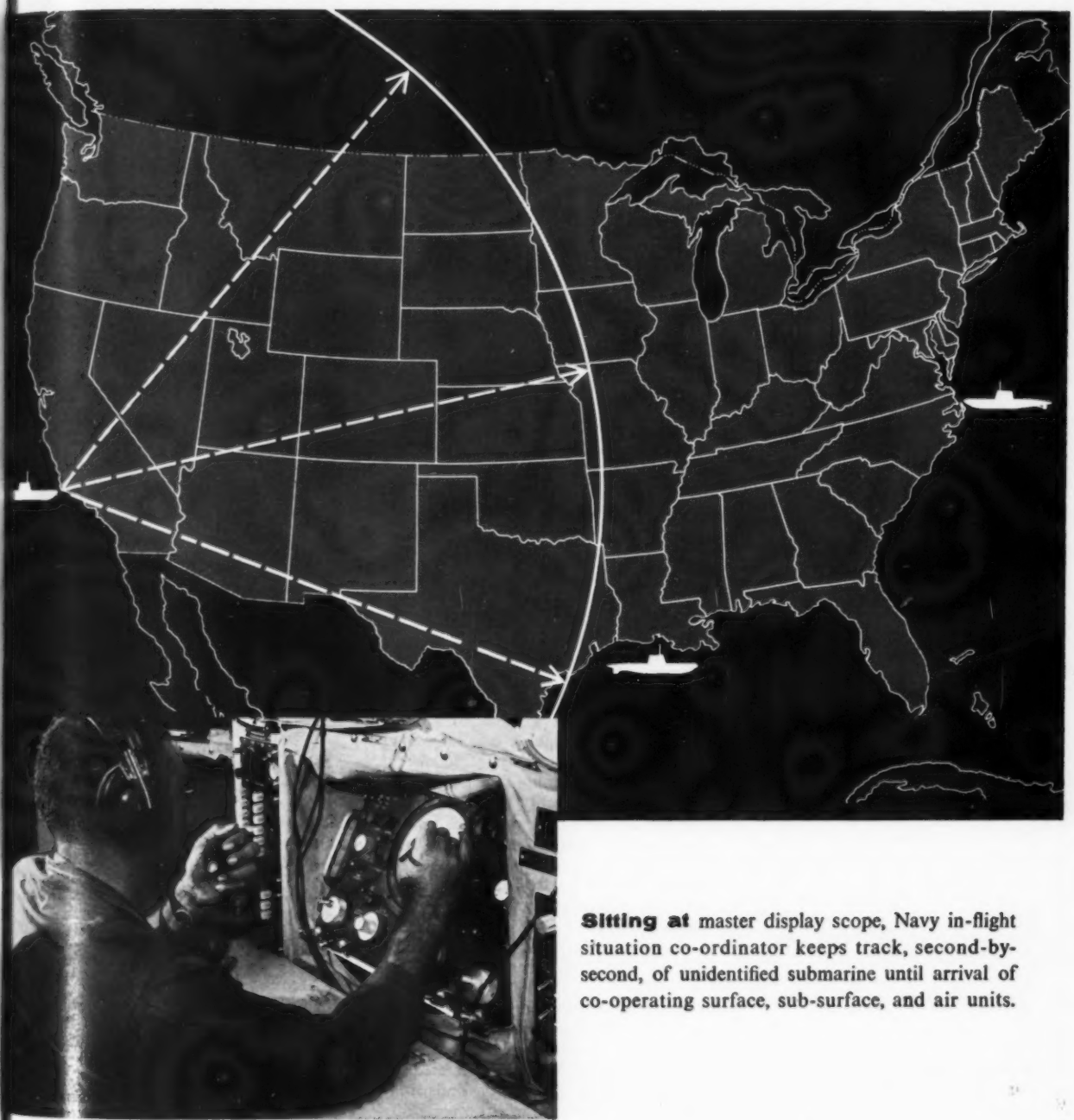
For 14 years land-based patrol planes—P2V Neptunes, designed and built by Lockheed—have been the backbone of the Navy's sub hunter-killer forces. Able to detect even submerged subs, the P2V Neptunes patrol vast ocean areas, night and day, routinely flying through storms and hurricanes that keep other aircraft out of the skies.

Lockheed has more experience in designing and manufacturing Anti-Submarine Warfare planes than any other company. It has more in-being facilities for producing ASW planes than any other manufacturer. Lockheed can build new and better ASW planes—in *less time* than anybody else, and for *fewer defense dollars.*

World's most efficient and formidable sub hunter-killer plane—a direct design descendant of performance-proved ELECTRA—P3V-1 is being developed for the U.S. Navy.



While the P3V-1 is capable of making kills of enemy subs, unaided, one of its vital missions is to provide co-ordination for anti-submarine units within the search area.



Sitting at master display scope, Navy in-flight situation co-ordinator keeps track, second-by-second, of unidentified submarine until arrival of co-operating surface, sub-surface, and air units.

LOCKHEED AIRCRAFT CORPORATION, CALIFORNIA DIVISION

Burbank and Palmdale, California

ANTI-SUBMARINE PATROL PLANES • JET FIGHTERS • JET TRAINERS • LUXURY AIRLINERS
AIRBORNE EARLY-WARNING AIRCRAFT • PROP-JET TRANSPORTS

LOCKHEED

Circle No. 11 on Reader Service Card.

WEST COAST TALK

By Fred S. Hunter

Airlines, which ordered Boeing 707s or Douglas DC-8s with JT3 (J57) engines—with the idea that they might later be converted to the more powerful JT4 (J75) powerplants—now are studying P&W's proposed turbofan version of the J75. Everyone seems to be in agreement now that the economy of the fan engine will pay off. P&W is reported quoting a price of $195,000 for a turbofan JT3. This compares with the current price of $155,000 for a turbojet JT3; $245,000 for a turbojet JT4. Engine prices, of course, are always subject to change, but if the price for a turbofan JT3 has to be increased so would the turbojets. P&W could deliver on a turbofan JT3 order in 18 months from receipt.

• **Small engines**—A turbofan JT3 isn't the only fan bait P&W is dangling before the aircraft designers. A brand new one is a turbofan version of the JT12 (J60) to develop approximately 4,000 lbs. of thrust. Four of these would make a wellnigh perfect fit for a 45,000 or 50,000-lb. jetliner to carry 45 or 50 passengers over short ranges. Then there's a fan version of P&W's J52, a candidate for the Boeing 727 and the Douglas DC-9. It is a little high in thrust for the airplanes Boeing and Douglas now have in mind, but it might be scaled down. It is interesting to note, incidentally, that the current DC-9 design has been scaled back from the 125,000-lb. airplane Douglas previously contemplated to a configuration more on the Boeing 727 size, 85,000 or 90,000 lbs. accommodating 80 or 85 passengers.

• **Heliports**—After a lapse of more than 20 years, passenger air service has been restored to Glendale, whose Grand Central Airport, back in the early 30s was the biggest airline terminal on the West Coast. But instead of a multi-million dollar airfield for jetliners, the Glendale passenger facility today is a modest heliport, built by the city and leased to Los Angeles Airways at the going rate of $25 a month. Glendale has a trading area of 300,000 and it will grow to about 500,000. But, being a part of the greater trading area of Los Angeles, it falls under the enveloping shadow of the Los Angeles International Airport, and, anyway, there are no open spaces for an airport. Thus, Glendale's future in air transportation lies within the link fencing of the little, neatly-packaged heliport. The potential for Los Angeles Airways is tremendous. It takes little imagination to foresee the little Glendale heliport's growth into a much busier place than was the old Grand Central Airport—even in its heyday as the great Los Angeles terminal for the far-reaching transcontinental routes of American Airlines and TWA. There are other Glendales in the U.S. to give substance to the future of the helicopter carriers.

• **Rate problem**—Deferred air freight brought in more than $600,000 in revenue for The Flying Tiger Line in fiscal 1958, but the trouble with this reduced-rate business is that it aggravates the return-haul problem. The back haul is the difference between profit and loss. This was dramatically illustrated by the Tiger line in an experimental period last fall when for one month it scheduled enough extra sections to take care of all the freight it was offered in New York for shipment to the West Coast. It couldn't generate a corresponding quantity of eastbound freight on the coast, so it had to deadhead its big Super Constellations back to New York. It did the biggest volume of traffic in the history of the company—and lost money. Sadder, but wiser, the Tiger line went back to the struggle to balance directional loads.

• **Small business**—North American Aviation, which has always taken so much pride in the high percentage of work placed with companies in the small business category, finds itself in a dilemma in its role as weapons-system contractor on the F-108 and B-70. Its subcontractors are Boeing, Chance Vought, Convair, The Garrett Corp., Hamilton Standard, Lockheed, Marquardt and so on, all, of course, big business. So NAA keeps pounding away at its subs to sub-sub to small business to try to keep the ratio healthy. It ain't easy.

PEOPLE

. . . Manufacturing/Military

August C. Esenwein, who in the past eight years has established himself in the aircraft industry as the father of the Air Force's concept of weapons system management, has moved into the executive vice president spot with the Convair division of General Dynamics. Convair had left the management gap unfilled since **John V. Naish** took over **Gen. Joseph T. McNarney's** position as president. McNarney retired last spring. The Ft. Worth division manager position Esenwein leaves has been filled by **Frank W. Davis,** and **Robert H. Widmar** succeeds Davis as chief engineer. Other managerial positions filled by Convair find **J. G. Zevely** the new vice president of contracts and commercial sales and **Elmer P. Wohl** vice president for planning.

ESENWEIN

STEWART

Sidney A. Stewart, one of the old timers in the aviation industry who touched bases on the airline side as president of Chicago & Southern Airlines and an executive v.p. of Delta, has been elected president of Chandler-Evans Corp., an affiliate of the Penn-Texas Corp. Stewart was v.p. and general manager of the company before it spun off of Pratt & Whitney Co. and incorporated as a separate organization early this month. He also at one time was an executive v.p. with United Aircraft.

RAdm. Rawson Bennett II has received President Dwight Eisenhower's nomination for another two-year term as Chief of Naval Research.

. . . Transport

The world's "oldest and largest" air freight organization, Air Express International Corp., named 10-year veteran **Alvin B. Beck** to its board of directors. As executive v.p. of the company, Beck directs all operating divisions and subsidiaries.

Edmund Converse, Capitol Hill assistant who turned airline executive when he organized Bonanza Air Lines in the early Forties, was elected chairman of the board at the company's regular quarterly meeting. The post had been vacant since April of last year.

British West Indian Airways' acting chairman, **H. O. B. Wooding,** has accepted the invitation of the Board to become chairman. He will have the assistance of **Air Commodore G. J. Powell,** who will serve as BOAC representative on the BWIA Board.

Strike settlements cost two airlines at least $2,850,000 in retroactive pay. Eastern Air Lines' back payments under new contract with International Association of Machinists were $2 million, Capital's about $850,000. TWA figure hasn't been revealed but would run three-carrier total close to $5 million. Capital also faces demand by Brotherhood of Railway Clerks for payment of wages to some of its members for the period of the IAM strike, when none of the members was working.

Extensive program of leasing ground equipment to airlines will be proposed by a company that now performs ground services for some carriers. Claim is that airlines will find lease deal cheaper than trying to arrange financing to buy loading steps, tow vehicles, power carts, etc.

There's optimism about 1959 traffic. While some carriers have been cautious about making predictions—in view of 1958's trunk passenger-mile increase of only 1%—at least three see a big year. A trunkline gain of 10% to 15% in traffic and revenue because of improved business conditions is forecast by William Hogan, American Airlines' executive vice president-finance, who adds that AA will top 20% due to its big jet lead. Northwest Airlines president Don Nyrop, whose line showed a record profit and a surprising 15% passenger-mile gain in 1958, predicts new highs this year. And Western president T. C. Drinkwater says 1959 will be the airline's biggest year.

What will be the cost of a third pilot in the jet cockpit? Details of American and Eastern pilot pay provisions aren't available yet, but observers were doing some speculating. Assuming the third man is paid $10,000 a year, plus allowance for fringe benefits and travel expenses, that 4½ crews per plane are required, and that there are 20 planes in the fleet, cost would be about $1 million a year. Further assuming eight hours daily utilization and 550 mph speed, a little over 3¢ a mile would be added to operating costs—or over two-thirds of one coach passenger's fare.

Despite strikes which grounded the two largest domestic carriers, American and Eastern, airline traffic in December declined only 12.6% from that of a year ago. With most of the other trunklines adding extra sections for the holiday rush, available seat miles during December dropped by nearly 25%. Also showing the effect of the holiday strike was the passenger load factor on the trunklines, which averaged 67.16%. The high December average offset somewhat the slow recession months in the spring and early summer to enable the trunklines to post an average passenger load factor for the year 1958 of 60.06%.

The Military Air Transport Association has been on a funding basis—making a "break-even" charge for passengers and cargo carried and reimbursing a capital fund—for less than a year and has already run itself into the red. Losses are so great that the Defense Department is pressing MATS to raise their passenger fares by 10% and their cargo tariffs by 14%.

"Basic disagreement remaining on jet fare differentials" has caused a postponement in the IATA traffic conference originally scheduled for late January in Paris. There is some doubt whether an agreement will be reached by the new conference date of February 15, although the Civil Aeronautics Board is said to be backing down from its previous hard and fast policy of no differential.

Timely boost for Decca and Dectra. British-built short- and long-range navigation aids, is British Overseas Airways Corp.'s decision to use this equipment in its North Atlantic de Havilland Comet 4 jet transport fleet. Whether Decca/Dectra, or a U.S. system such as Vortac or Loran C should be adopted as the standard, international aid unquestionably will be the subject of some strained sessions at the International Civil Aviation Organization (ICAO) meetings in Montreal next month.

Some airport operators are beginning to feel the impact of an order which prevents military jets landing at joint-use fields on cross-country or other indiscriminate flights. The order was issued by the Air Force Chief of Staff in an effort to reduce the number of near-misses reported between civil and military aircraft, but the loss in fuel sales makes the USAF birds more surely missed than many operators suspected.

S.1 will establish something of a record by running the gamut of hearings, committee action and floor action in one week. Senator A. S. Mike (D.-Okla.) predicted his newly introduced federal-aid-to-airports bill would clear the Senate by this month's end. Hearings on the measure opened January 22 and will be concluded January 26. S.1 would extend the Federal Airport Act for another five years from next July 1 at an increased level of $100 million annually, with an added $75 million discretionary funds for fiscal 1960. House version, introduced by Rep. Oren Harris (D.-Ark.), provides no extra discretionary fund, but would up the present $63 million annually to $100 million for five years beginning last July. H.R.1011 is identical to the bill vetoed by the President last year.

FAA's independent status could be short lived if a bill proposed by Rep. J. Arthur Younger (R.-Calif.) makes headway. H.R. 985 would abolish not only FAA, but the CAB, the FCC and ICC, and incorporate all within a cabinet-level Department of Transportation and Communication. An identical measure introduced by Younger during the 85th Congress died in committee. It is expected to at least reach the hearing stage during the current session with sentiment reportedly growing in favor of placing all transportation and communication media under a single cabinet head.

Wrong airport (name, that is). Air Traffic Control Association takes exception to the similarity between Washington National and Washington International once the latter is built at Chantilly, Va. It is hoped the stage is never reached where pilots will be routed into the wrong traffic pattern because somebody didn't heed ATCA's warning.

Another break in the "solid" front of airlines remaining at Willow Run Airport is imminent. Delta Air Lines is preparing to shift its operations to Detroit Metropolitan, May 1. This will bring the total number of scheduled airlines operating at the new airport to three trunks and one local service air carrier. American, Northwest and Allegheny moved to the closer-in Detroit airport last fall. Remaining at Willow Run will be Capital, Eastern, North Central, TWA, United, Lake Central and Mohawk.

No one knows from nothing at FAA and if they do they're not talking. Delay in the organization of FAA, which was expected would be fully completed January 1, has former CAA officers and personnel figuratively hanging in mid-air, not knowing what to expect, what their functions will be, and what the fate of projects currently under way will be under the new set-up. Business presumably is going on as usual, but with a number of top posts still remaining unfilled, uncertainty dominates the atmosphere.

From American Airlines' new sales boss:

Jet Shortage by 1962?.... Maybe

By Eric Bramley
Chief News Editor

There's no magic formula that will produce a mass market to fill the seats on U.S. jet transports. But load factors will be adequate, and it may well be that by 1962 American Airlines will find that it doesn't have enough jets and turboprops, instead of having the large number of empty seats that some people fear.

So states Charles A. Rheinstrom, AA's executive vice president-sales, who after a 12-year absence, returned to the company last April to take on the job of seeing that the seats are filled.

And this will be no small job. AA has on order 50 Boeing 707s, 35 Lockheed Electras and 25 Convair 600s. Two of these planes were scheduled for almost simultaneous introduction—the Electra on Jan. 23, the Boeing on Jan. 25.

Several months ago, Harvard's Dr. Paul Cherington, in a report prepared for the White House, stated that airline traffic will have to grow 11% to 13% a year to maintain satisfactory load factors in the jet age. He urged new promotional efforts to broaden the market. In September, CAA Administrator James Pyle said the airlines must get into mass transportation, and several weeks later CAB Chairman James R. Durfee called on the carriers to tap new markets.

• **You have to take risks**—Asked about these remarks, Rheinstrom says: "The same statements were made in the past, every time we bought a new airplane—the DC-3 through the DC-7. There were doubts that we could fill the added capacity.

"We'll get the traffic for the jets, but it's impossible to pinpoint where it will come from. You can't pinpoint sources of future air traffic with any accuracy.

"None of us knows what improvements will do for us. The concept is the same as it has always been, but it's bigger, more staggering. We have much more to sell—that's what C. R. Smith meant when he said jet transportation will be the easiest thing to sell that we ever sold. The product is so much more attractive.

Charles A. Rheinstrom

"But it won't be an easy 'sell.' And there are no unique methods—just good, basic salesmanship. We must stress comfort, speed, dependability, price, utility.

"In this business, you have to take some risks. If, several years ago, C. R. Smith had insisted that his staff tell him exactly where American was going to get the traffic to fill the new planes he was thinking of ordering, he would never have bought them.

"The first thing you have to do is to believe in this business—that this is the ultimate in transportation, that it has exclusive advantages—and that they're becoming more important all the time. The benefits haven't yet registered forcibly on all the people."

Rheinstrom emphasizes that it's impossible to predict where business will come from, that this same situation has existed in every form of transportation. "No one could forecast how many passengers would ride from A to B in an automobile versus the horse and buggy. There's no way to tell why people will do things they've never done before. They'll invent reasons."

• **The unsold market**—Even now, and at present fares, there is a much big-

American Scores a First

Two new turbine-powered transports—the Lockheed Electra and the Boeing 707—have been placed in scheduled service by American Airlines almost simultaneously—the first such undertaking by any carrier. The Electra went on the New York-Chicago route Jan. 23, six roundtrips daily. First U.S. transcontinental jet service opened between New York and Los Angeles on Jan. 25, one roundtrip daily (increasing to two on Feb. 1).

• **Why the simultaneous start?**—When it became obvious that the two planes would be available about the same time, AA had a choice: Introduce them as soon as possible, or allow perhaps a month to elapse between them and get two publicity breaks. AA chose the former, believing that the double impact of new turbine aircraft on both medium and long-range routes would be more effective.

The Electra started at standard fare. AA was planning to start the Boeing with a $10 surcharge both first-class and coach (56 seats in each compartment). But on Jan. 15, CAB said it would allow the surcharge only in the first-class compartment and would suspend and investigate AA's proposal for an extra coach fare. AA was asking CAB to reconsider its decision, and the issue was unresolved at presstime. With surcharges, first-class fare would be 7.12¢ per mile, coach 4.67¢.

• **Why a surcharge?**—A traveler's time is worth money, and the jet saves him three hours transcontinentally, AA says. It adds that appointments are superior to the best piston-engined planes—bigger seats (two-abreast first-class seats have tables between them), more space (37-inch seat spacing in the three-abreast coach cabin against not more than 34 inches prescribed by IATA) and wide aisles.

. . . Rheinstrom's 13 reasons for optimism

. . . In the front office

C. R. SPEERS
Sr. Vice President
Passenger Sales

S. C. DUNLAP
Vice President
Cargo Sales

W. PLAYER
Vice President
Public Relations

G. M. SADLER
Vice President
Sales Services

C. H. STARTUP
Asst. Vice President
Sales

H. D. REYNOLDS
Asst. Vice President
& Gen. Traffic Mgr.

J. E. BRADY
Director
Advertising

R. A. MEYER
Director
Sales Budgets

. . . In AA's five regions

H. J. LYALL
Vice President
New England

W. N. BUMP
Vice President
Eastern

S. G. KING
Vice President
Central

R. L. FITZPATRICK
Vice President
Southern

A. R. BONE
Vice President
Western

ger market available—but the airlines haven't sold it, he feels. "The cost of air travel today is not beyond the reach of most people. They think it is, and we've made it seem out of reach. We've made it seem that the airplane is used by the sophisticated, the well-to-do. The man on the street hasn't been able to identify himself in this picture. We've got to put across what it really costs to fly—that it's inexpensive."

It seems safe to say that this remark presages a change in AA's advertising approach—on which Charlie Rheinstrom now calls the shots. Incidentally, it was Rheinstrom who, many years ago, spearheaded AA's bold "Afraid to Fly?" advertising campaign, at a time when safety was a hush-hush subject. He had entered aviation in 1928 with Thompson Aeronautical Corp., an AA predecessor, and stayed with AA until 1946 when he set up his own aviation consulting firm. Later, he was senior vice president of Erwin Wasey & Co. and vice president and a director of J. Walter Thompson.

Pleasure travel, he believes, offers a big potential, especially with the car rental tie-in, but "anyone who thinks air travel is cheaper than driving your own car is out of his head." It would be "slightly unrealistic" to think that the airplane is going to make a big dent in the very short-haul auto market. On the other hand, there are lots of people who don't have time to drive on longer trips, and they will turn to the airlines.

"You hear it said that we can't expect to get much more business travel. But I'm not one of those who thinks that this market is anywhere near exhausted. There are still lots of businessmen riding trains."

Rheinstrom says this about fares: The market is far from exhausted at the present level; lower charges will broaden that market, and reductions should come as rapidly as economically possible. Several years ago, president C. R. Smith said the U.S. needed a good 3¢ airline. The figure may not be the same, Rheinstrom says, because 3¢ isn't worth what it was at that time, "but we still feel that way about it. However, we don't know how quickly it can come." AA wants to try some promotional fares, "but I can't spell it out for you yet. But we want to do it."

The fact that there is multiple competition on many routes may slow down the arrival of lower fares, he warns. "High production brings lower rates, but with too much competition nobody gets big enough."

• **Operations vs. sales**—AA's sales department under Rheinstrom has been undergoing major changes in preparation for the jet age. Importantly, there is now a definite and clearcut division of responsibility between sales and operations.

"Operations is responsible for making the product—the thing that we sell," he says. "Operations takes over at the point where the passenger begins to get what he bought—and that's when he goes through the gate to the plane. Up to this point, it's a sales function; nothing has been delivered to him—he's still entitled to a full refund.

"The dividing line is the gate, the place where he says: 'Give me this thing that I paid for.' The gate attendant works for operations. So do stewardesses—they're part of what the passenger has bought."

AA's employes are now split to fit this concept. At small stations, where an operations man may also have certain sales functions, sales direction is funneled to him through his boss.

Sales, of course, must be concerned with the type of product that operations makes. In AA, sales consults with operations on schedules, for example, and makes other decisions on service. "It's the same as any other business—sales interprets what the public wants and needs, then operations produces it."

• **The team**—Thirteen people now report directly to Rheinstrom.

This team and the salability of the new equipment are the principal reasons why Rheinstrom sees a rosy future. He sums it up: "People are going to go places they never dreamed of going before—places that seemed too far away. A guy comes home for dinner tonight, but how far away was he this morning?"

Argosy Freightercoach Future Looks Bright

By Anthony Vandyk
International Editor

It's a pretty sure bet that the Armstrong-Whitworth Argosy—first flown this month—will be carrying Riddle Airline markings this October. Plans now call for a three-month—and possibly a six-month—trial over the carrier's routes.

And while A-W performance engineers were in the U.S. completing discussions with Riddle on operating costs of the Dart-powered aircraft, the British government ordered the new transport into production. Although details of the order have not been disclosed, it is reported that about 25 will be bought to be operated by the Royal Air Force. Since unit sales price is about $1.3 million, this order should just about cover development cost, which is estimated at $30 million.

Preliminary design work was begun in late '55 and on Sept. 11, 1956, the Board of the Hawker Siddeley Group —of which A-W is a component company—gave the green light.

A-W was charged with the design and manufacture of the complete fuselage, tail booms, the wing trailing edge, the flaps and basic design of the tail. Gloster, another component company of the Group, was made responsible for the detail design of the side doors, flaps, outer nacelles and tail. A. V. Roe, a third component company, contributed its experience in building wings for Shackleton bombers by designing and fabricating the Argosy wing—essentially the same structure. A fourth Hawker-Siddeley company, Air Service Training, was also involved, principally with ground equipment.

Production is facilitated by the use of the same power package forward of the fireproof bulkhead as that used on the Vickers Viscount. Four Rolls-Royce Darts (526 R. Da 7/2 of 2,100 ehp) drive 11½-ft. Rotol propellers. Later versions may be fitted with two Tynes instead of four Darts, which may limit take-off performance under certain conditions. But the 4,700-ehp turboprop offers greater fuel and lower specific installed weight.

Actually Armstrong-Whitworth has designed six versions of the Argosy.

1. A.W. 650 Argosy Freightercoach (4 Rolls-Royce Darts). Pressurized fuselage for operation over medium ranges. Freight loaded at front and rear of fuselage via side-hinged doors. A-W claims that this aircraft will make it possible to reduce the overall costs per unit load handled to the lowest levels yet reached.

2. The A.W. 651 (2 Rolls-Royce Tynes) will be identical with the A.W. 650 except for powerplant.

3. A.W. 660 Military Transport (4 Rolls-Royce Darts). Performance similar to A.W. 650. Fitted with special beaver tail rear doors incorporating a built-in loading ramp. Unobstructed floor can take a variety of military vehicles and equipment. Hold designed for air-dropping.

4. A.W. 661 (2 Rolls-Royce Tynes) will be identical with the A.W. 660 except for powerplant.

5. A.W. 670 Air Ferry (4 Rolls-Royce Darts). Wider, unpressurized double-deck fuselage for short-haul car, freight or coach-class passengers. Six cars, side by side in pairs, and 30 'upstairs' passengers can be carried in car ferry configuration.

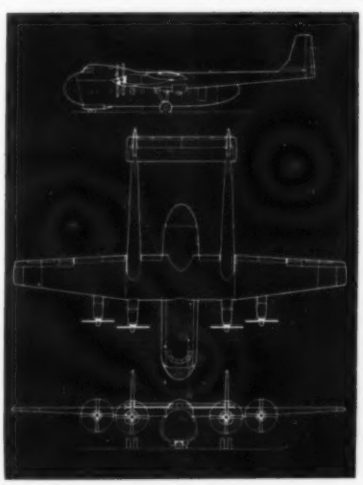
6. A.W. 671 Airbus (4 Rolls-Royce Darts). Short-range transport for 126 coach-class or 116 tourist-class passengers. On lower deck 96 seats are placed eight abreast, back to back. Direct operating cost on route-lengths up to 200 miles is under 2 cents per seat-mile.

That the Argosy bears some similarity to the Fairchild C-119 and the Nord Noratlas is no coincidence. Armstrong-Whitworth design teams visited Fairchild and Nord Aviation and discussed the design with engineers of both the U.S. and French companies, but the Argosy contains a number of new features.

The fuselage has both frames and stringers attached to the skin to provide alternative load paths and as many "crack stoppers" as possible. Extensive use has been made of Redux bonding—window reinforcements, skin doubler plates and much of the tail unit are examples.

The first Argosy is currently undergoing flight tests and nine more are due to fly before the end of the year. Both British Air Registration Board and CAA certification is expected by mid-1960.

A. W. 650 Specifications



Dimensions

Span	115 ft.
Length	86 ft. 9 in.
Height	27 ft.
Gross Wing Area	1,458 sq. ft.
Fuselage Length	60 ft. 7 in.
Aspect Ratio	9.07
Fuel Capacity	3,960 gal.
Gross Freight Volume	3,680 cu. ft.
Freight Floor Area (gross)	426 sq. ft.

Weight 82,000 lb.

Performance

Take-off Field Length	4,050 ft.
Mean Cruising Speed (14,000 rpm.)	296 mph
Maximum Cruising Altitude	25,000 ft.

Hold Dimensions

Overall Length		46 ft. 8 in.
Width at Floor Level		10 ft. 0 in.
Maximum Width		11 ft. 8 in.
Minimum Height		6 ft. 8 in.
Maximum Height		8 ft. 9 in.
Hold Floor Level Above Ground		4 ft. 0 in.
Forward Door:	Min. Width	8 ft. 4 in.
	Height	6 ft. 8 in.
Rear Door:	Min. Width	8 ft. 8 in.
	Height	6 ft. 8 in.

INTERNATIONAL REPORT

By Anthony Vandyk

Swissair's jet planners are well pleased with the performance of the DC-8 under emergency conditions. Under the airline's "paper jet" program the possible failure of two engines and the pressurization system has been carefully examined. To make the situation as bad as possible the emergency was simulated to have developed at the Point of Equal Time between Shannon and Gander on a day when minimum fuel would be carried. It was assumed that after the emergency the flight continued to Gander or Shannon at 14,000 ft. Fuel remaining upon arrival at either was found sufficient for three hours' holding at the same altitude. Moreover, the Swissair "paper jet" planners found that if these airports were closed, Goose Bay or London could be reached with two hours' holding.

• **Double trouble**—Gerhard Höltje ranks high among the contenders for the title of the most hard-worked man in aviation. Since early last year he has had responsibility for the running of both the technical and commercial sides of Lufthansa's operation. The German airline has a rather unusual management structure with two chief executives—Höltje in charge of technical matters and Hans Bongers as head of the commercial side. But Bongers has been incapacitated for many months as the result of a serious automobile accident and Höltje has had to assume both responsibilities. Complicating the task for Höltje and other top management members of Lufthansa is the location of the airline's headquarters in Cologne and its technical base in Hamburg.

• **Spanish surprise**—Except for those who are close to the Spanish scene, few people would guess that Iberia's busiest route is that from Barcelona to Palma on the Mediterranean Island of Majorca. In 1958 the Spanish airline carried 141,000 passengers on this 122-mile route. Many of these were foreign tourists who might have preferred other arrangements, but Spanish government policy restricts the frequency and capacity of foreign carriers to Palma, and Iberia has only a couple of flights a week from London—and these only during the summer. The result is that most tourists have to travel to Barcelona and switch there to domestic services operated by Iberia and Aviacion y Comercio, the other Spanish airline. Perhaps the least attractive feature of the Barcelona-Palma service is the antiquated equipment—usually Bristol 170s.

• **Joint ventures**—Cooperation is the order of the day of the British aircraft industry. Latest example: Vickers-Armstrongs and English Electric will work on the Royal Air Force's Canberra replacement "on a 50-50 basis." Powerplant for the new STOL aircraft will come from another team of manufacturers, Bristol-Siddeley. This is the first military project to be built by various former competitors on a joint basis, but last year it was announced that the DH 121 jet transport for British European Airways will be manufactured by Airco—a joint venture of de Havilland, Fairey and Hunting.

• **Help for Fairey**—British European Airways' decision to issue a letter of intent for six Rotodynes should help the Fairey Aviation Co. The manufacturer wants to show that there is a real interest in the VTOL craft in order to obtain financing to continue the development program. BEA is probably more interested in the projected 60-seat version powered by two Rolls-Royce Tynes than the smaller version now flying in prototype form. An ultimate requirement for 20 Rotodynes is envisaged by BEA. British observers wonder whether New York Airways, which has shown an intense interest in the Rotodyne, will now follow BEA's example and issue a letter of intent. Clearly, until the certification status is more closely determined, no operator will place a firm order. The one-Rotodyne contract signed by Fairey and the Okanagan Helicopter Group last year undoubtedly contains provisions about the certification. Okanagan, currently operating a fleet of 54 helicopters, plans to use the Rotodyne between city centers in Canada although it has not as yet applied to the Canadian Air Transport Board for permission.

TRANSPORT AVIATION

British Transport Up

Independents report gain in all classes but mail

LONDON—Britain's financially insecure independent airlines were given a word of encouragement by Harold Watkinson, Minister of Transport and Civil Aviation, at a recent annual dinner of the British Independent Air Transport Association.

Addressing the group, which serves the Minister in an advisory capacity and also makes recommendations regarding the granting of operating licenses to independent carriers, Watkinson declared that he favored establishing a new type of air transport advisory council, but not one similar to any such group as the U.S. CAB.

He said he did not contemplate setting up anything as elaborate, "and

Summary of Operations

Scheduled Services of British Independent Airlines

	1956-57	Percentage Change	1957-58	Percentage Change
Capacity ton-miles	35,238,000	— 5	41,882,000	+ 20
Load ton-miles	21,934,000	+ 2	25,051,000	+ 14
Overall Load Factor	62.2%		59.9%	
Passengers carried	690,859	+ 22	776,364	+ 12
Passenger-miles	163,231,000	+ 27	178,979,000	+ 10
Freight (short tons)	68,972	— 18	86,656	+ 26
Freight ton-miles	6,944,000	— 33	8,569,000	+ 23
Mail (short tons)	70	+ 70	44	— 37
Mail ton-miles	51,000	+ 30	33,000	— 35
Aircraft miles	11,739,000	+ 4	12,512,000	+ 7
Inclusive Tours (Not included in the above)				
Capacity ton-miles	7,469,000	+110	10,772,000	+ 44
Passengers	108,434	+108	144,878	+ 34
Passenger-miles	67,021,000	+111	97,362,000	+ 45

Nonscheduled and Other Operations of BIATA Members

	1956-57	Percentage Change	1957-58	Percentage Change
Capacity ton-miles available	111,656,000	— 5	111,448,000	—
Load ton-miles	89,024,000	—	94,050,500	+ 6
Passengers carried:				
Civil	322,538	+ 24	307,692	— 4
Military	157,035	— 22	137,821	— 12
Total	479,573	+ 4	445,513	— 7
Passenger-miles:				
Civil	144,044,000	+ 13	112,274,000	— 22
Military	516,302,000	—	729,271,000	— 41
Total	660,346,000	+ 2	841,545,000	+ 27
Freight (short tons)	54,895	+ 24	30,030	— 45
Freight ton-miles	29,980,000	—	54,547,000	+ 80
Aircraft miles	19,183,000	— 5	22,225,907	+ 16

NOTE: Traffic results are as of 30th June each year.

so far as I understand long-winded," as the U.S. Civil Aeronautics Board procedure. London observers point out, however, that to establish such a body would require amendment of the Civil Aviation Act and, therefore, could not be done rapidly.

The view of the independent airlines is that they should be allowed to operate scheduled services in their own right and not merely as associate companies of British European Airways and British Overseas Airways Corp.

The BIATA annual report for the year ended June 30, 1958 shows the independent airlines offered 164 million capacity ton-miles, approximately 25% of the total U.K. air transport effort. In passengers carried, the most important operation of the British independent airlines was scheduled services (776,364 passengers or 58% of the total). However, in passenger-miles, scheduled services amounted to only 16% (179 million) while air trooping accounted for 66% with 729 million passenger-miles performed, even though only 137,000 passengers (10%) were carried.

The fleet of the BIATA member airlines now comprises 219 aircraft including 75 four-engine models. Most of the aircraft are DC-3s, Bristol 170s, Vikings, Yorks and Hermes.

. . . Transport Briefs

• **Prototype Max Holste Super Broussard,** French twin-engine commercial transport, is reported to be nearing completion with the maiden flight slated to take place early this year.

• **Piedmont Airlines** now serves 31 cities with its F-27 equipment. Louisville, Ky. and Charlotte, N.C. are the latest cities to be added to the F-27 schedules.

• **Remert-Werner Corp.** will have three HeliCabs in operation as aerial taxicabs by the end of this month. Service will offer first competition to Hempel Helicopter and Air Taxi Co.

• **Bald Eagle Air Transport Co.** has inaugurated intrastate air service in New Mexico using twin-engine Beech aircraft.

• **Northwest Airlines** is being sued by Airlines National Terminal Service Corp. for breach of contract. ANTSCO claims NWA violated its agreement when it moved from Willow Run to Detroit Metropolitan without giving the required one-year and 15-day notice required.

Now certificated by C.A.A.
NAPIER ELAND Convair Conversion

The ELAND conversion gives to operators

HIGHER PROFITS

IMPROVED PERFORMANCE

EXTENDED SERVICE LIFE

EASIER AND CHEAPER MAINTENANCE

GREATER SAFETY AND PASSENGER APPEAL

The Eland-powered Canadair 540 is now in production

NAPIER Eland turbo-prop

NAPIER ENGINES INC. Suite 909, Dupont Circle Building, 1346 Connecticut Avenue, N.W., Washington 6, D.C. Telephone: NOrth 7-9300 to 7-9304

SUBSIDIARY OF D. NAPIER & SON LIMITED, LONDON, ENGLAND

A Member of The ENGLISH ELECTRIC Aviation Group

Circle No. 12 on Reader Service Card.

Summary of U.S. Airline Traffic for September 1958 vs. September 1957

Compiled by American Aviation Publications from Official CAB Data

Airlines	Revenue Passengers (In Thousands) 1958	1957	% Change	Revenue Passenger Miles (In Thousands) 1958	1957	% Change	Total Ton-Miles Rev. Traffic 1958	1957	% Change	% Available Ton-Miles Used 1958	1957
DOMESTIC											
American	630	653	— 3.5	432,160	439,510	— 1.7	53,357,256	51,945,316	2.7	58.9	57.5
Braniff	174	167	4.2	75,387	73,210	3.0	8,289,456	7,837,266	5.8	49.0	47.4
Capital	336	358	— 6.1	135,124	138,333	— 2.3	14,179,427	14,434,753	— 1.8	49.5	48.6
Continental	75	73	2.7	38,389	34,212	12.2	4,014,653	3,573,710	12.3	40.5	43.3
Delta	217	211	2.8	101,847	101,144	0.7	11,568,747	11,121,146	4.0	51.1	51.6
Eastern	601	619	— 2.9	302,496	315,488	— 4.1	31,871,260	32,902,811	— 3.1	42.9	50.4
National	99	73	35.6	54,573	43,572	25.2	6,024,192	4,738,583	27.1	39.4	48.1
Northeast	73	74	— 1.4	23,118	23,719	— 2.5	2,392,467	2,411,224	— 0.8	29.6	35.7
Northwest	142	130	9.2	104,808	91,609	14.4	11,831,622	10,191,988	16.1	50.7	52.4
Trans World	392	417	— 6.0	337,712	348,741	— 3.2	36,445,859	37,151,056	— 1.9	58.6	56.0
United	599	559	7.2	447,205	435,855	2.6	53,375,357	50,127,792	6.5	57.3	57.0
Western	113	123	8.1	60,270	62,116	— 3.0	6,429,172	6,560,292	— 2.0	41.6	55.0
TOTALS	**3,451**	**3,457**	**—0.2**	**2,113,089**	**2,107,509**	**0.3**	**239,779,468**	**232,995,937**	**2.9**	**52.1**	**58.3**
TERRITORIAL											
Caribair	17	14	21.4	1,156	945	22.3	125,204	102,176	22.5	59.3	54.6
Hawaiian	32	33	— 3.0	12,105	4,950	144.5	1,273,397	520,854	144.5	74.7	55.5
Trans Pacific	15	17	—11.8	2,167	2,381	— 9.0	182,235	207,063	—12.0	52.2	60.6
TOTALS	**64**	**64**	**....**	**15,428**	**8,276**	**86.4**	**1,580,836**	**830,093**	**90.4**	**69.8**	**56.6**
LOCAL SERVICE											
Allegheny	43	41	4.9	7,429	7,152	3.9	773,131	727,763	6.2	47.1	45.1
Bonanza	14	13	7.7	3,138	2,804	11.9	317,965	281,187	13.0	39.7	42.0
Central	12	11	9.1	2,386	2,099	13.7	250,929	215,876	16.2	31.5	31.7
Frontier	20	20	....	4,636	5,254	—11.8	536,511	599,403	—10.5	54.1	66.6
Lake Central	16	14	14.3	2,412	2,274	6.1	253,872	237,596	6.9	40.6	40.5
Mohawk	39	39	....	7,439	7,560	— 1.6	752,036	770,491	— 2.4	51.5	47.8
North Central	68	62	9.7	11,560	10,153	13.9	1,177,673	1,039,330	13.3	49.0	48.2
Ozark	38	38	....	6,453	6,191	4.2	672,330	639,742	5.1	50.7	45.6
Pacific	32	31	3.2	7,030	6,630	6.0	695,241	651,938	6.6	48.1	56.8
Piedmont	35	34	2.9	6,970	6,897	1.1	713,502	699,773	2.0	50.2	51.6
Southern	18	17	5.9	3,220	3,104	3.7	338,441	319,631	5.9	37.6	36.9
Trans-Texas	20	20	....	4,562	4,477	1.9	483,611	471,559	2.6	39.1	38.9
West Coast	21	23	— 8.7	3,975	4,120	— 3.5	403,752	405,898	— 0.5	47.6	48.4
TOTALS	**376**	**363**	**3.6**	**71,210**	**68,715**	**3.6**	**7,368,994**	**7,060,187**	**4.4**	**46.4**	**46.9**
HELICOPTER SERVICE											
Chicago	12	7	71.4	215	120	79.2	21,875	13,519	61.8	28.3	29.1
Los Angeles	3	3	....	103	94	9.6	16,231	14,336	13.2	59.5	62.1
New York	10	6	66.7	187	109	71.6	20,929	13,496	55.1	47.1	45.6
TOTALS	**25**	**16**	**56.3**	**505**	**323**	**56.3**	**59,035**	**41,351**	**42.8**	**39.6**	**41.7**
INTERNATIONAL											
American	11	11	....	9,534	7,616	25.2	1,249,029	1,129,188	10.6	52.9	61.3
Braniff	4	4	....	6,940	8,709	—20.3	887,830	1,033,405	—14.1	43.7	50.3
Delta	4	5	—20.0	5,493	6,966	—21.1	657,311	822,131	—20.0	45.7	54.8
Eastern, Overseas	30	28	7.1	43,230	36,343	18.9	4,624,355	3,974,445	16.4	51.9	61.1
San Juan	23	21	9.5	35,032	30,071	16.5	3,756,473	3,271,116	14.8	55.5	60.9
Bermuda	4	4	....	3,022	2,947	2.5	319,235	307,781	3.7	42.6	49.6
Mexico	3	3	....	5,176	3,325	55.7	548,647	395,548	38.7	39.6	46.8
National	8	4	100.0	5,656	3,315	70.6	661,017	381,665	73.2	52.1	46.1
Northwest	14	11	27.3	28,842	24,950	15.6	5,260,345	4,205,878	25.1	71.1	71.3
Hawaiian	2	1	100.0	3,975	2,815	41.2	458,995	314,558	45.9	60.4	50.6
Panagra	11	12	— 8.3	12,955	14,878	—12.9	1,899,443	2,105,442	— 9.8	54.1	60.0
Pan American, System	239	249	— 4.0	369,405	363,388	1.7	49,557,641	48,339,198	2.5	66.3	66.6
Latin American	87	95	— 8.4	96,641	107,414	—10.0	13,576,060	15,665,445	—13.3	63.7	65.3
Atlantic	126	124	1.6	183,565	156,563	17.2	23,213,995	19,508,629	19.0	65.1	63.6
Pacific	22	23	— 4.3	84,791	91,536	— 7.4	12,119,356	12,080,615	0.3	73.6	69.3
PDX/SEA-HON.	1	2	—50.0	2,591	4,574	—43.3	318,575	509,835	—37.5	42.0	50.9
Alaska	4	7	—42.8	4,408	7,875	—44.0	648,230	1,084,509	—40.2	51.5	52.2
Trans Caribbean	6	.....	....	13,182	.....	....	1,297,590	.....	....	80.6	....
Trans World	34	34	....	101,007	91,107	10.9	12,207,196	10,938,385	11.6	61.4	65.3
United	9	10	—10.0	22,200	25,898	—14.3	2,509,215	2,804,609	—10.5	59.8	66.6
Western	2	2	....	2,503	2,510	— 0.3	275,626	275,441	0.1	47.3	53.2
TOTALS	**372**	**370**	**0.5**	**620,947**	**585,680**	**6.0**	**81,086,598**	**76,009,787**	**6.7**	**63.4**	**63.5**
ALASKAN											
Alaska	7	6	16.7	3,970	2,086	90.3	723,866	562,609	28.7	47.2	43.3
Alaska Coastal	4	5	—20.0	399	459	—13.1	49,154	55,215	—11.0	64.2	66.5
Cordova	1	2	—50.0	173	385	—55.1	52,427	187,518	—72.0	51.4	52.0
Ellis	6	7	—14.3	319	366	—12.8	36,784	41,795	—12.0	68.9	69.3
Nor. Consolidated	2	2	...	702	571	22.9	184,028	155,035	18.7	67.0	61.1
Pacific Northern	10	10	...	9,578	10,296	— 7.0	1,461,961	1,496,435	— 2.3	65.3	64.3
Reeve	1	1	...	1,014	822	23.4	248,861	150,521	65.3	64.7	56.4
Wien	4	3	33.3	1,268	859	47.6	340,222	284,334	19.7	48.2	60.0
TOTALS	**35**	**36**	**—2.8**	**17,423**	**15,844**	**10.0**	**3,097,303**	**2,933,462**	**5.6**	**57.7**	**57.2**

CAB Report & Forecast

Secrecy reared its ugly head at the Board again last month. Because details might be politically embarrassing to the Thai government, the CAB decided to withhold every scrap of information about a proposed management contract submitted for approval by Northwest Airlines. If the CAB had approved, Northwest was prepared to help Thai Airways start flying again. But the CAB disapproved for reasons not given, leaving Thai Airways and its three Super-G Constellations still grounded.

• **There was no secret about the Board's decision** in the Intra-Alaska investigation, but there was some confusion. Part of this stemmed from the fact that the CAB picked up two unresolved questions in the States-Alaska case and ruled on these without benefit of an examiner's report.

The two items—which many had forgotten were still pending in this long, drawn-out pair of investigations—were the question of Pan American's unwanted Nome-Fairbanks route and additional service to Kodiak. Almost as an afterthought, the CAB canceled Pan American's Nome-Fairbanks certificate and added Kodiak to Pacific Northern's Anchorage-Seattle flights.

In the complex series of rulings on the intra-Alaskan carriers and their routes, the Board—in its own words—has attempted "to establish an intra-Alaskan route structure which we believe will facilitate an overall reduction in the subsidy requirements of Alaskan air service and provision of improved Alaskan services."

• **International affairs** continue to occupy the Board's left hand: French, Italian, German, Belgium, Mexican, Canadian, Argentine, and Japanese bilateral questions have been subject of recent meetings. Negotiations with Japan have resulted in amendments to the air bilateral giving Japan Air Lines additional West Coast traffic rights, and U.S. carriers a better shake at Tokyo on capacity and frequency restrictions.

• **Upcoming at the Board**—A hearing in New York today (January 26) on New York Airways certificate renewal . . . hearings starting February 2 in Washington on American Express' freight forwarder operations, control, etc. . . . a Washington hearing February on the Board's investigation of the inadequacy of air service at Toledo.

THE BULLETIN BOARD

Undisplayed Advertising: $2.00 per line, minimum charge $6.00. Cash with order. Estimate 30 capital letters and spaces per line; 40 small lower-case letters and spaces per line. Add two lines if Box Number is included in lieu of advertiser's name and address.

Displayed Advertising: $20.00 per column inch. Space units up to full pages accepted in this section for classified-type advertising.

Forms close three weeks preceding date of issue. Address all correspondence to Classified Advertising Department, American Aviation Publications, 1001 Vermont Ave., N. W., Washington 5, D. C.

FOR SALE
C-46F AIRCRAFT
Passenger and Cargo
With or Without
T-Category Kit Installed
Immediate Delivery
The Flying Tiger Line Inc.
Burbank, Calif.
Call or Cable
Fred Benninger
Executive Vice President
Tel: Stanley 7-3411 Cable: Flytiger

AN FITTINGS & HARDWARE
Stainless, Aluminum, Brass, Steel All sizes—immediate delivery from world's largest shelf stock. Buy direct from manufacturer. Lower prices—quicker service. Send for free wall charts showing complete line of AN & MS fittings and hardware. We machine parts to your own print; also, we sell AN & MS Forgings.
COLLINS ENGINEERING CORPORATION
9060 Washington Blvd., Culver City, California

Help Wanted

AIRLINE
MAINTENANCE and ENGINEERING VP
For medium sized airline
Previous airline management experience necessary including budget and cost control. Salary open. All inquiries held confidential. Send detailed resume including age, education, experience and salary required . . . to.
AVIATION ACTIVITIES
148-15 Hillside Ave. Jamaica, New York

GENERAL TRAFFIC MANAGER—for scheduled airline located in Northwest. Must have airline reservations ticketing and general traffic experience. Salary commensurate with experience and ability. All replies confidential. Submit complete details and resume to Box 174, **AMERICAN AVIATION** Magazine, 1001 Vermont Ave., N.W., Washington 5, D.C.

SENIOR CIVIL ENGINEER (Airport Development) wanted by New York State Department of Commerce. Salary Range $7,500 to $9,090. Civil Service examination to be held March 14, 1959. Write to **NYS Department of Civil Service, Albany 1, N.Y.** before February 13 for detailed announcement and application forms.

AD INDEX

Aeroquip Corp. 22, 23
Agency—The Fred M. Randall Co.

Aircraft Radio Corp. 2
Agency—Burke Dowling Adams, Inc.

AiResearch Mfg. Co., Div., The Garrett Corp. 14
Agency—J. Walter Thompson Co.

Sir W. G. Armstrong Whitworth Aircraft, Ltd. 10
Agency—Dolan Ducker Whitcombe & Stewart Ltd.

Bulletin Board (Classified) 41

Chandler-Evans 43
Agency—G. F. Sweet & Co., Inc.

Collins Radio Co. 44
Agency—W. D. Lyon Co.

Decca Navigator Co., Ltd., The 6, 7
Agency—John Tait & Partners Ltd.

Lockheed Aircraft Corp. .. 30, 31
Agency—Foote, Cone & Belding

Martin Co., The 8, 9
Agency—VanSant, Dugdale & Co., Inc.

D. Napier & Son, Ltd. 39
Agency—C. R. Casson Ltd.

Phillips Petroleum Co. 24
Agency—Lambert & Feasley, Inc.

Resistoflex Corp. 21
Agency—Marsteller, Rickard, Gebhardt & Reed, Inc.

Rohr Aircraft Corp. 13
Agency—Barnes Chase Co., Inc.

Rolls-Royce, Ltd. 4
Agency—The Wesley Associates, Inc.

OUT COLLECTING NEW AIRPORTS on North Central last September, WWP gets present of can of each brand of beer brewed in Milwaukee. At left is Jim Palm, NOR station manager, and center is Frank Buttomer, NOR vice president traffic and sales.

EN ROUTE

Wayne W. Parrish

The Strange 'Customs' of Andorra, Tiny Co-Principality in the Pyrenees

This is about Andorra, the tiny co-principality in the Pyrenees. Having had a fine lunch at the small but good Lion d'or restaurant in the French town of Perpignan, my wife and I took off in our Mercedes-Benz 219 for the 55-mile winding road up the north slope of the Pyrenees to Bourg-Madam, a small French town near the Spanish border. It was a beautiful sunny afternoon. To get to the road into Andorra we had to continue up over a pass, above the tree line, and down several miles on the north side.

And here was the road to Andorra which had been solidly blocked by snow on two previous visits (May), but wide open and clear this time (September). It was well-paved. With a feeling of exhilaration, encouraged by cars on their way out, we proceeded into the mountainous area with a feeling that this time we'd make it. We only hoped there'd be a hotel room available when we got to a town.

Some miles along the Andorra road, and so high that we were again above the tree line, we came to French customs. Once we explained that we were proceeding through Andorra to Madrid, the French were happy. The reason wasn't hard to find. On the Andorra side were lots of shops selling everything from liquor to cigarettes to appliances. Andorra is one of the great smuggling centers of the world and French customs have a constant running battle with Frenchmen going into Andorra and coming out loaded with all sorts of tax-free goods.

We stopped only briefly and headed on up the pass. The macadam pavement became a dusty road, very dusty indeed, and there was a lot of car traffic. Didn't seem much like an isolated middle-ages country. At about 7,500 or 8,000 feet, the top was reached and we started down into a valley that became beautiful and clean as we descended. Also, the macadam pavement returned. So now we were in a country which calls itself "The Valleys of Andorra," consisting of two big valleys and two branches of the Valira River.

It can almost be said that Andorra consists of one continuous street in a deep valley, surrounded by handsome mountains. We reached a town called Les Escaldes, where most of the few hotels are, and found one we thought was okay for the night, name of Hotel Valira. There are no first-class, or even second-class, hotels, but the half-dozen third-class ones are adequate. The one main street was crowded with cars and people and I had a hard time finding a spot to park—and turning around is a major task.

Now here's the payoff. Here is this little country of 5,500 people, consisting chiefly of one narrow street or road, and loaded with stores and shops, brightly lighted and modern, crammed with the most universal selection of electrical appliances, watches, liquors, radios, perfumes, cigarettes, phonographs, etc., you can imagine. Not just French and Spanish stuff, but German, British and American as well. And everything dirt cheap.

Andorra does a land-office business in tax-free goods for all those who can get there—and get the stuff back into their own countries without paying much customs. I understand Andorra is a great purchaser of Cadillacs, but nobody living there could possibly have any real use for one. Refrigerators of all kinds. What do you want? You can order it in Andorra. How you get it out is your business.

Sure, I even bought some stuff, it was so cheap. I bought a bottle of Scotch for about $3. Perfumes were cheap, if you're smart enough to outsmart the Andorrans and know whether you're getting the real stuff. Electric razors? Plenty of them from all countries. Cameras by the shopful. Yet the snow isolates Andorra seven or eight months of the year from France. The result is that most shipping and most trade is via Spain, and the shipping port is Barcelona. Smuggling over the mountains must be a very difficult job; but I wouldn't pretend to know how you work it.

I did hear in Barcelona that if a Spaniard wants a new GE refrigerator, it's ordered in Andorra from the U.S., shipped to Barcelona, then shipped by truck to Andorra. Then some "defect" is found, so it is shipped back to Barcelona "for repairs" or "for parts". And somehow the refrigerator never does get back to Andorra.

There is no Andorran currency. They use mostly Spanish pesetas, but most prices are also in French francs, and they'll take any currency—especially including dollars. Very few Americans go to or through Andorra and such outfits as American Express and the American Automobile Association have no information available about it. It's about 525 miles from Paris and 375 from Madrid. Altitudes of most of the towns range from 3,000 to 4,000 feet.

But if you're driving in the Pyrenees, or going to Spain from France, get a good map and find your way through Andorra. Just remember the French entrance is blocked except in summer. One night is enough, but it's an interesting out-of-the-way place, a leftover from feudal days.

Next morning we drove on to Spain. From the top of the pass at the French end, the road descends continuously right on through Andorra. The entrance is about 7,500 feet; the exit must be about 2,000.

We were stopped no less than four times by Spanish customs. Since we had American passports, they didn't bother us, nor did they really give us a baggage examination. But they sure can go through the baggage of their own people. What intrigues me is the fact that Andorra exists primarily from selling tax-free goods, yet there were scores of customs men at both the French and Spanish borders, all looking for contraband. An interesting game. Obviously, customs can't be very effective, or Andorra would starve to death.

We reached Lerida for lunch. Restaurant La Rada highly recommended. Had some fine caneloni and the service was friendly and excellent. But Lerida has poor hotel facilities for overnight stops, as we found out a few years ago.

Although the distance from Andorra to Madrid was only 375 miles, that's a long drive in Spain despite the improved roads. Several years ago it was difficult to drive at 30 miles an hour. Now you can sometimes get up to 50 without wrecking your car, but the average speed is kept down by curves, repairs and unexpected holes.

Spain is a problem to the motorist because there are long stretches without any place to eat or sleep. It was too early to turn in when we got to Zaragosa, and Madrid was too far, and anyway my room reservation wasn't until next day. In the Spanish edition of *Guide Michelin* I had spotted a government-operated rest house at Medinaceli, about 100 miles from Zaragosa and 90 miles short of Madrid. If we could get a room there, we'd be fine. If we couldn't—well, I'd just have to drive on to Madrid and take a chance late at night.

Just at nightfall, we got to Medinaceli but almost missed the sign leading off to the rest house—they don't believe much in road signs in Spain. I backed up, and took a small road to the top of a hill overlooking a wide area and drove up to the entrance of the rest house. Would there be a room? Well, thank the Lord, there was. I breathed a big sigh of relief because I didn't want to drive 90 more miles, especially at night.

Circle No. 13 on Reader Service Card.

FIRST CLASS
Permit No. 2455-R
(Sec. 510 P. L. & R.)
Washington, D.C.

BUSINESS REPLY CARD

No postage stamp necessary if mailed in the United States

POSTAGE WILL BE PAID BY

AMERICAN AVIATION
1001 Vermont Avenue, N.W.
Washington 5, D.C.

FIRST CLASS
Permit No. 2455-R
(Sec. 510 P. L. & R.)
Washington, D.C.

BUSINESS REPLY CARD

No postage stamp necessary if mailed in the United States

POSTAGE WILL BE PAID BY

AMERICAN AVIATION
1001 Vermont Avenue, N.W.
Washington 5, D.C.

Aircraft Data Cards

Aircraft selected for the data cards in this issue are Lockheed's C-130B Hercules, Cessna's 310C and Martin's P6M-1 SeaMaster.

Fitted with more powerful engines and four-bladed propellers for better performance, the C-130B is an advanced development of the C-130A.

The 310C is Cessna's 1959 version of the basic 310 series. It features more powerful engines and major changes in performance, equipment and styling.

The P6M-1 SeaMaster has been built in small numbers for evaluation by the Navy. Production versions will be designated P6M-2.

LOCKHEED C-130B HERCULES (USAF)

USMC: GV-1
USCG: SC-130B

Aircraft Data Card
January 26, 1959

Copyright 1959
American Aviation Publications, Inc.

CESSNA 310C

USAF: U-3A (310)

Aircraft Data Card
January 26, 1959

Copyright 1959
American Aviation Publications, Inc.

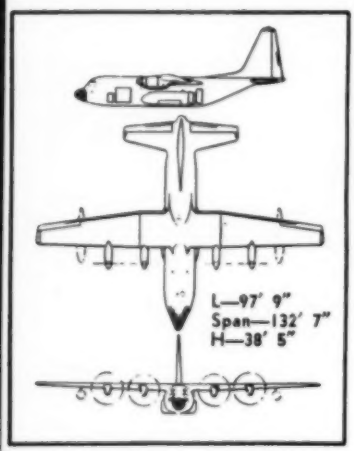
MARTIN P6M-1 SEAMASTER

Aircraft Data Card

Copyright 1959

—FOR MORE INFORMATION—

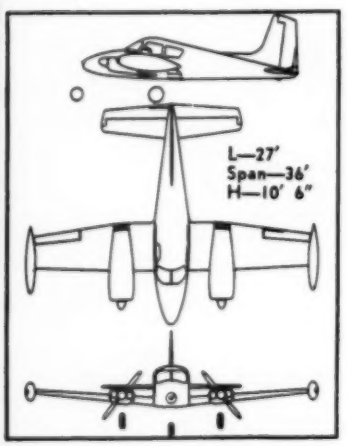
USE THE ATTACHED REPLY CARDS for additional information about any product or service advertised or reported in this issue of AMERICAN AVIATION. Circle the numbers on the card that correspond with numbers appearing beneath items described. Requests will be forwarded to the companies concerned. No additional postage required.



LOCKHEED C-130B HERCULES

TYPE: military, 4-engine, troop and cargo turboprop transport. WEIGHTS: empty—67,165 lbs.; gross—135,000 lbs. POWERPLANTS: (4) Allison T56-A-7s; max. rating—4,050 shp. PERFORMANCE: max. speed—335 kts.; cruise speed—320 kts.; initial rate of climb—1,900 fpm; range—3,430 n.mi.; takeoff ground roll—3,200'; landing ground roll—1,550'. MFR: Lockheed Aircraft Corp., Georgia Div., Marietta, Ga.

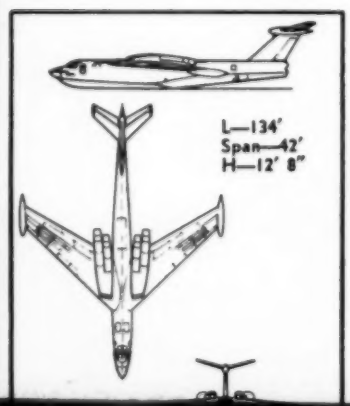
NOTES (for your personal use):



CESSNA 310C

TYPE: 4-5 place, twin-engine business aircraft. WEIGHTS: empty—3,020 lbs.; gross—4,830 lbs. POWERPLANTS: (2) Continental 10-470-Ds; max. rating—260 hp. PERFORMANCE: max. speed—242 mph at S/L; cruise speed—220 mph, 70% power at 8,000 ft.; max. range—1,110 mi. with 100 gal. fuel cap., 171 mph at 10,000 ft.; initial rate of climb—1,800 fpm. MFR: Cessna Aircraft Co., Wichita, Kan.

NOTES (for your personal use):



MARTIN P6M-1 SEAMASTER

TYPE: Navy, 4-place, 4-engine, mine laying and photo reconnaissance jet flying boat. WEIGHTS: gross—160,000 lbs.; payload—approx. 30,000 lbs. POWERPLANTS: (4) Allison J71s; max. rating—13,000 lbs. st. PERFORMANCE: max. speed—over 600 mph; range—over 1,500 mi. MFR: The Martin Co., Baltimore 3, Md.

NOTES (for your personal use):

AMERICAN AVIATION READER SERVICE CARD

Jan. 26, 1959

Expires thirty days after above date.

Circle numbers below for information on products, literature or advertisements. Please limit requests to ten items.

1	2	3	4	5	6	7	8	9	10	11	12	13	14
15	16	17	18	19	20	21	22	23	24	25	26	27	28
29	30	31	32	33	34	35	36	37	38	39	40	41	42
43	44	45	46	47	48	49	50	51	52	53	54	55	56
57	58	59	60	61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80	81	82	83	84
85	86	87	88	89	90	91	92	93	94	95	96	97	98
99	100	101	102	103	104	105	106	107	108	109	110	111	112
113	114	115	116	117	118	119	120	121	122	123	124	125	126

name _____

title _____

employer _____

address _____

city _____ zone ____ state _____

For quicker processing please give information requested below

Please check the one category that best describes your business or occupation:

- ☐ Aircraft Manufacturer
- ☐ Engine Manufacturer
- ☐ Ground Support Mfr.
- ☐ Aircraft Syst., Comp. and Mat. Mfr.
- ☐ U.S. Scheduled Air Carrier
- ☐ U.S. Cargo, Supp. Air Carrier
- ☐ Foreign Air Carrier
- ☐ Bus., Ind. Aircrft. Operator
- ☐ Terminal Airport
- ☐ Fixed Base Ops., Maint., Repair, Overhaul and Dis.
- ☐ U.S. Mil. Com. Officer
- ☐ U.S. Mil. Non-Com. Officer
- ☐ U.S. Mil. Civ. Supvr.
- ☐ U.S. Civil Govt.
- ☐ State and Municipal Govt.
- ☐ Foreign Govt. (Mil. and Civ.)
- ☐ Aviation Consulting Firm
- ☐ Aviation Org. and Assn.
- ☐ Educational Institution

Please indicate your primary responsibility:

- ☐ Administrative/Financial
- ☐ Design/Engineering
- ☐ Production
- ☐ Operations/Maint/Ovrhl
- ☐ Purchasing/Sales
- ☐ Other _____

( ) I am (am not) now receiving my personal copy of AMERICAN AVIATION

AMERICAN AVIATION READER SERVICE CARD

Jan. 26, 1959

Expires thirty days after above date.

Circle numbers below for information on products, literature or advertisements. Please limit requests to ten items.

1	2	3	4	5	6	7	8	9	10	11	12	13	14
15	16	17	18	19	20	21	22	23	24	25	26	27	28
29	30	31	32	33	34	35	36	37	38	39	40	41	42
43	44	45	46	47	48	49	50	51	52	53	54	55	56
57	58	59	60	61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80	81	82	83	84
85	86	87	88	89	90	91	92	93	94	95	96	97	98
99	100	101	102	103	104	105	106	107	108	109	110	111	112
113	114	115	116	117	118	119	120	121	122	123	124	125	126

name _____

title _____

employer _____

address _____

city _____ zone ____ state _____

For quicker processing please give information requested below

Please check the one category that best describes your business or occupation:

- ☐ Aircraft Manufacturer
- ☐ Engine Manufacturer
- ☐ Ground Support Mfr.
- ☐ Aircraft Syst., Comp. and Mat. Mfr.
- ☐ U.S. Scheduled Air Carrier
- ☐ U.S. Cargo, Supp. Air Carrier
- ☐ Foreign Air Carrier
- ☐ Bus., Ind. Aircrft. Operator
- ☐ Terminal Airport
- ☐ Fixed Base Ops., Maint., Repair, Overhaul and Dis.
- ☐ U.S. Mil. Com. Officer
- ☐ U.S. Mil. Non-Com. Officer
- ☐ U.S. Mil. Civ. Supvr.
- ☐ U.S. Civil Govt.
- ☐ State and Municipal Govt.
- ☐ Foreign Govt. (Mil. and Civ.)
- ☐ Aviation Consulting Firm
- ☐ Aviation Org. and Assn.
- ☐ Educational Institution

Please indicate your primary responsibility:

- ☐ Administrative/Financial
- ☐ Design/Engineering
- ☐ Production
- ☐ Operations/Maint/Ovrhl
- ☐ Purchasing/Sales
- ☐ Other _____

( ) I am (am not) now receiving my personal copy of AMERICAN AVIATION

CECO NEWS

CHANDLER-EVANS SYSTEMS • CONTROLS WEST HARTFORD, CONNECTICUT

New Center Has Unique Features

The Control Console in CECO's newest test facility incorporates latest state-of-the-art instrumentation and provides for push-button ease of operation. Any malfunction in any part of the system activates both audible and visual alarms. Electrical interlocks automatically shut down the system and indicate the specific area of malfunction.

If the operator does not or cannot take the necessary corrective steps within a predetermined amount of time, required corrections are made automatically and the test is resumed.

Engineered for Safety

While the Test Platform with its Ambient Chambers can easily be seen through a maximum safety window in the forward wall of the Control House, all tests are 100% remotely controlled. Operators set and control temperatures and pressures, and assemble all necessary data at the Control and Instrumentation Console.

The entire CECO Thermo-Research Center has been painstakingly engineered to provide optimum safety, both for operating personnel and for the valuable mechanisms being tested.

So thorough are the safety precautions that despite the hazards inherent in handling fuels at elevated temperature, lowest premium cost fire insurance premiums on this facility are in the category ("Sprinkler Rating").

Described as "Operator-Proof"

A highly complex operator-overriding system, developed especially for this facility, assures proper operation at all times. Operator errors, if and when they occur, are corrected automatically.

Fuel Density Indicator

A meter in the Control House gives continuous indication of fuel density. It gets its signal from the intensity of radiation through a section of the fuel conduit. Isotope Cesium 137 is used in this radiation process.

Chandler-Evans Announces New High-Temperature Test Center

LATEST CECO DEVELOPMENT TOOL: Two structures make up the Chandler-Evans Thermo-Research Center. One (shown above in foreground) is a concrete and steel, insulated and soundproofed Control House.

The second structure (background above) is an "open air" Test Platform, sheltered from the elements by a sheet metal roof containing plastic blow-out sections. Test Chambers and all associated equipment are installed on this platform.

S. A. Stewart Lauds CECO's New Test Lab

"This unique engineering tool will enable CECO to continue developing superior products empirically," said Sidney A. Stewart, General Manager of Chandler-Evans, when the company's new Thermo-Research Center was unveiled for the aircraft industry.

He went on to point out that high-temperature problems have become increasingly critical with advancing speeds of air and space vehicles. "We expect to find in this new laboratory definitive answers to a variety of questions relative to the precise metering of liquid fuels at high temperatures," he said.

Further underscoring the importance of *temperature extremes* in the modern aircraft and missile industry, Stewart mentioned concurrent activities in the cryogenics field. He said CECO is designing and producing devices for use in liquid nitrogen systems, for example, where temperatures of –330° F. are encountered.

Part Numbering

To simplify trouble-shooting and minimize time losses when repairs or replacements are required, each of the three

CECO Facility Tests Fuel Devices In Environments To 1000°F.

West Hartford, Conn. (CECO)—Completion of a new and vastly capable Thermo-Research Center has been announced by Sidney A. Stewart, General Manager of Chandler-Evans. The 100% company-owned facility is considered to be unique in the modern aircraft industry. It is designed to subject sensitive fuel mechanisms and other hydraulic devices to elevated temperatures similar to those developed in ultra high-speed flight.

As a development tool, the Center is expected to provide answers to many questions that have perplexed engineers since advanced air speeds first began to create critical high-temperature problems.

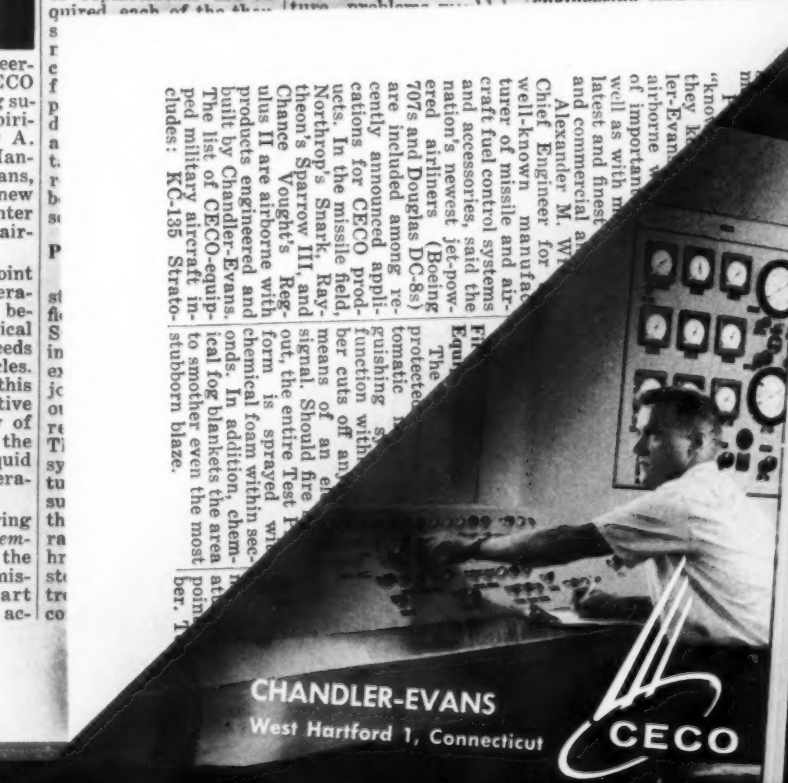
Chandler-Evans has been "hot-testing" aircraft engine accessory products for a number of years. Initially, relatively simple facilities were equal to the task. But, as aircraft and missile speeds advanced into Mach ranges, it became apparent that temperature problems [illegible] (to accommodate 300-hour fuel system tests, for example) can be carried out twenty-four hours a day, seven days a week.

Others to Use Lab

CECO's new Thermo-Research Center has been made available to others, according to Ercole J. Vitali, Manager of the Company's Engineering Test and Experimental Departments.

On a limited basis, the laboratory and its staff will be put at the disposal of manufacturers who are similarly concerned with the functional performance of liquid fuels, fuel system components, and other hydraulic equipment when subjected to the stresses of elevated temperature. Ambient and fuel temperature capabilities currently specified are 1000°F. and 500°F. respectively.

Vitali went on to say that subcontract customers can gain valuable time and save money as well by calling on CECO's engineering staff [illegible]



Collins RC-101 provides remote control of slave VHF stations.

Strategically spaced stations provide direct contact with aircraft anywhere on Delta's domestic routes. "C" indicates control center.

BLANKET VHF COVERAGE WITH COLLINS REMOTE CONTROL

unattended operation is key to Delta system

Direct, instantaneous communication for jet age operations is now a reality anywhere on the domestic routes of Delta Air Lines, the nation's sixth largest air carrier.

Collins RC-101 Remote Control System — utilizing slave radio stations — is providing reliable air/ground VHF coverage for Delta over distances previously impossible with line-of-sight radio frequencies.

Unattended receiver-transmitter stations strategically spaced along Delta's domestic routes allow continuous "push-to-talk" contact between Delta operators and aircraft anywhere on these routes. Voice transmission and control of all transmitter-receiver functions are maintained over long line telephone circuits.

Contributing to the success of Delta's unattended communication network are the highly reliable Collins 242F VHF Transmitters and 51M VHF Receivers.

COLLINS

CREATIVE LEADER IN ELECTRONICS

COLLINS RADIO COMPANY • CEDAR RAPIDS • DALLAS • BURBANK

Circle No. 14 on Reader Service Card.